September 1978

Smithsonian

A kindred species aids the whooping crane (p. 52); here, sandhill cranes provide a foster family for young whooper in middle

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We think you'll go wild over them.

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INEXPENSIVE. AND BUILT TO STAY THAT WAY.

*These figures are 1978 EPA test estimates for Subaru 4 Wheel Drive vehicles. Your actual mileage may vary due to the way you drive, driving conditions, the condition of your car and whatever optional equipment you might have. © Subaru of America, Inc., 1978.

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September 1978

Smithsonian

Volume 9, Number 6

Table of Contents

COVER: Lone young whooping crane, backed up by sandhill foster family, was among first five reared in the wild in a new experimental program (p. 52)
Photograph by Thomas D. Mangelsen

10 The view from the castle: Secretary Ripley's comments

16 Around the Mall and beyond by Edwards Park

25 Letters to the Editor

34 Phenomena, comment and notes by James K. Page jr.

42 The National Bureau of Standards, the inquisitive agency that explores just about everything (first of two parts)
By Keith Wheeler, drawing by John Huehnergarth, photographs by Robert C. Lautman

52 To help save the endangered whooping crane, biologists put whooper eggs in the nests of sandhills, which then hatch the eggs and rear the young as their own
By David R. Zimmerman

66 Hundreds of thousands of weekend off-road vehicle (ORV) enthusiasts are destroying part of the desert
By David Sheridan, photographs by Howard Wilshire

78 Specially designed "hands-on" museums in San Francisco and Brooklyn invite exploration of science and nature
By Sherwood Davidson Kohn
Photographs by Jonathan Atkin and Christopher Springmann

89 Stanley William Hayter, widely considered the most influential engraver alive, observes his 50th anniversary
By Adrienne Farrell

96 The days when tall ships called at Puget Sound were recorded by an obscure but talented photographer
By Robert A. Weinstein, photographs by Wilhelm Hester

106 With the Royal Castle nearing completion, Warsaw is being restored to its pre-World War II brilliance
By Tad and Marianne Szulc
Color photographs by Dmitri Kessel

120 Narrowly escaping modernization, Cape May is a gem of architectural restoration—a Victorian showcase
By Willard Sterne Randall, photographs by Farrell Grehan

133 J. J. Grandville's phantasmagoric view of humanity
By Michael Olmert

143 Fossil hunters find treasures in Manhattan buildings
By Marion Steinmann, photographs by Bill Ray

152 Book reviews

160 Additional reading

164 Smithsonian tours

166 September events at Smithsonian

171 Picture credits

172 Wait—perhaps your cause is already lost
By Cyra McFadden

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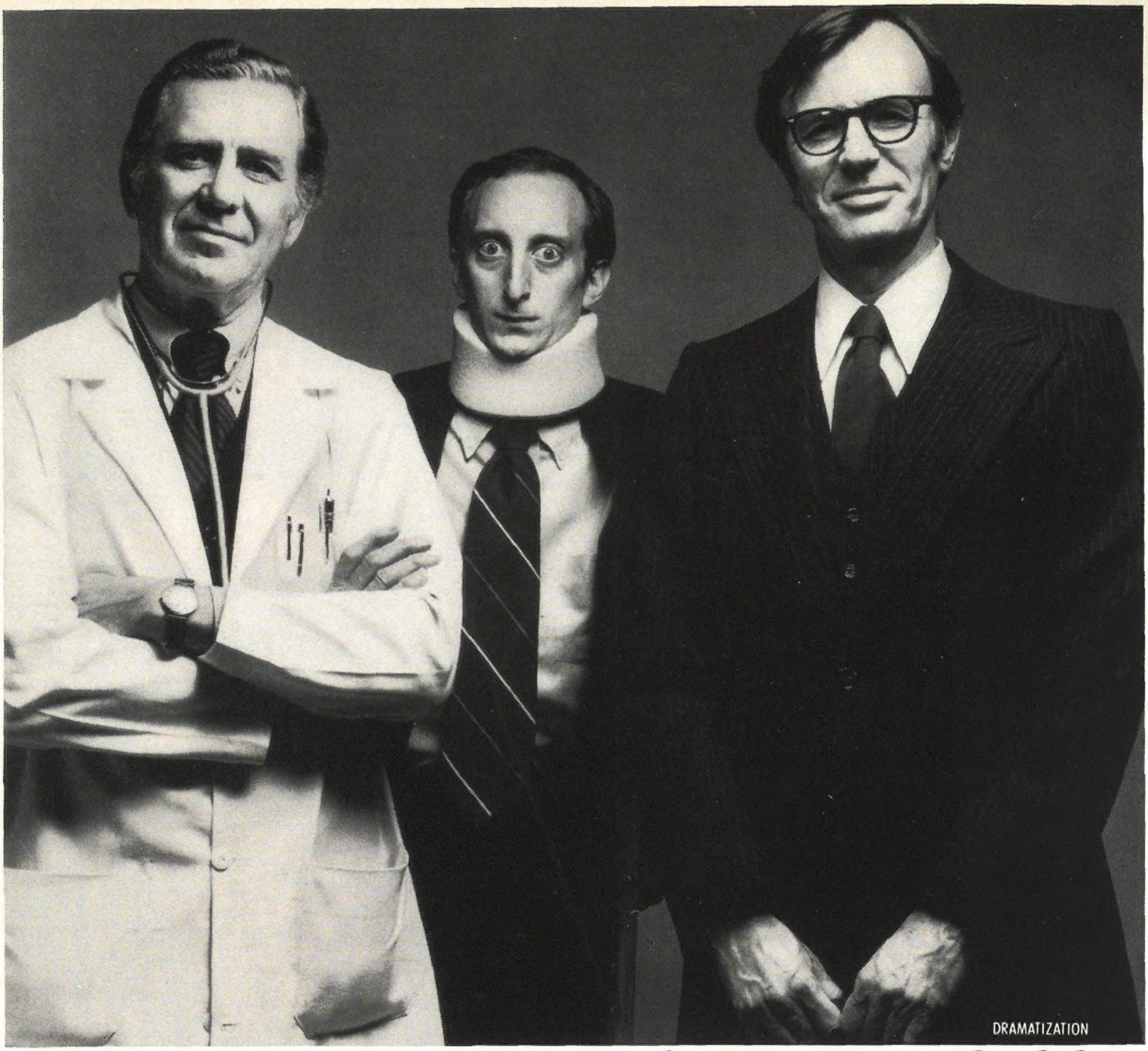

The man in the middle just won a big award.

This is the true story of the victim of an automobile accident.[1] Let's call him Phil.

A jury has finally[2] awarded Phil $12,000 for his losses (and the court tacked on $1,160 for costs), so why isn't *he* smiling?

Watch closely as the tort system gobbles up that $13,160:

Phil's lawyer (at right) takes $6,450 off the top.[3]

Dr. A (at left) gets $600 in witness fees. (He charged only $425

for treating Phil in the first place—in this crazy system you sometimes make more by telling a court what you did than you make by actually *doing* it.)

Doctors B and C take $325 more in witness fees and another $470 or so falls through the cracks, leaving Phil with a check for $5,311[4]— nearly three years after his accident.

Now a system that used up 3 years and $8,000 to put $5,300 into a victim's hands may strike you as unwieldy. And Ætna agrees.

State by state, we're supporting strong, workable "no-fault" auto insurance plans.[5] Where no-fault isn't in the cards, we think compulsory arbitration can help get most cases settled faster and more economically.

Lawyers' contingent fees should be better controlled. And, where appropriate, victims' payments should be made periodic, rather than in one lump sum which some outlive and others never need.

Passing the laws to reform this system is slow, frustrating work, but it is the key to controlling auto insurance costs. Don't underestimate your own influence with your elected representatives. Use it as we are trying to use ours.

Ætna wants insurance to be affordable.

[1]We've taken poetic license and put a neck brace on Phil, although his actual injuries didn't require it.

[2]Nearly three years passed between Phil's accident and his award. Such time lags are often a cause of grave hardship, and are a strong indictment of the present tort system. Chief Justice Warren Burger put it this way: "The business of involving the judicial process to dispose of an automobile accident is an expensive and cumbersome method that should be abandoned, as we did with industrial-injury claims long ago."

[3]Lawyers handling liability cases generally charge a "contingent fee"—a percentage of the award paid to the victim (the percentage may be as high as 50%). Phil's lawyer claimed 40% of the jury award for his fee plus $1,650 for certain costs advanced. He later advised the press that he had reduced his fee.

[4]In other words, only 44% of the jury award actually reached the victim. More than half was consumed by the costs of an inefficient system—costs which are reflected in the premiums of insurance buyers.

[5]"No-Fault" is first-party protection. Your insurance covers *your own* medical expenses and lost wages; the losses of whomever you hit (or get hit by) are covered by *his* insurance. No-fault has enormous potential for speeding and simplifying claim payments and controlling the cost of auto insurance. Unfortunately, the no-fault laws in many states (including the state where Phil lived) have so many loopholes that they fail to keep most claims out of court. Ætna supports the passage of federal guidelines which would require states to enact strong laws with real consumer protection.

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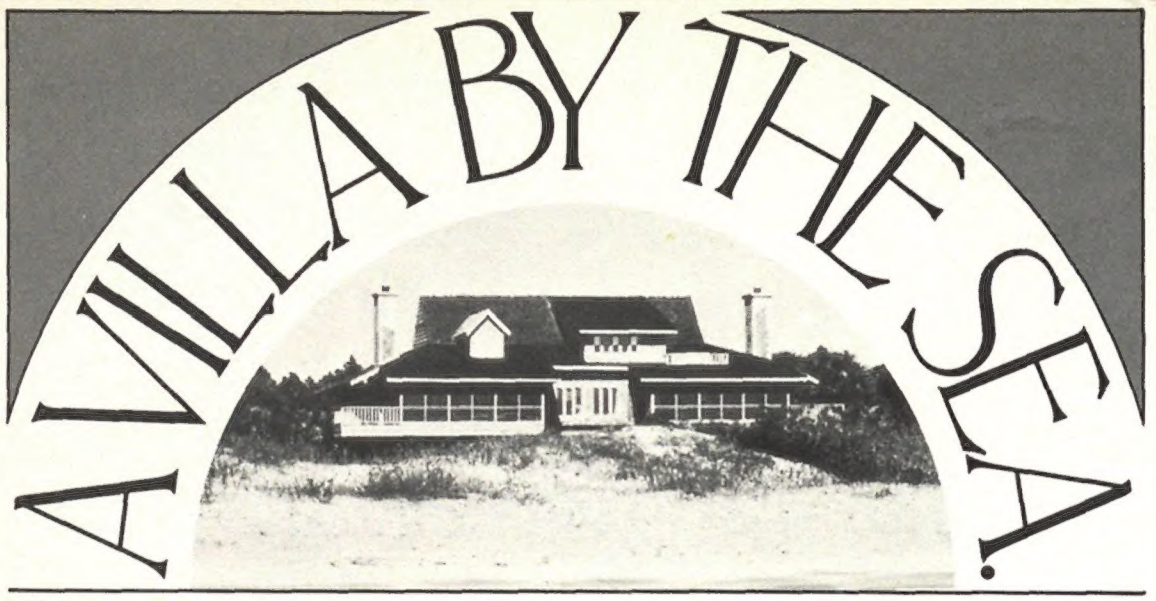

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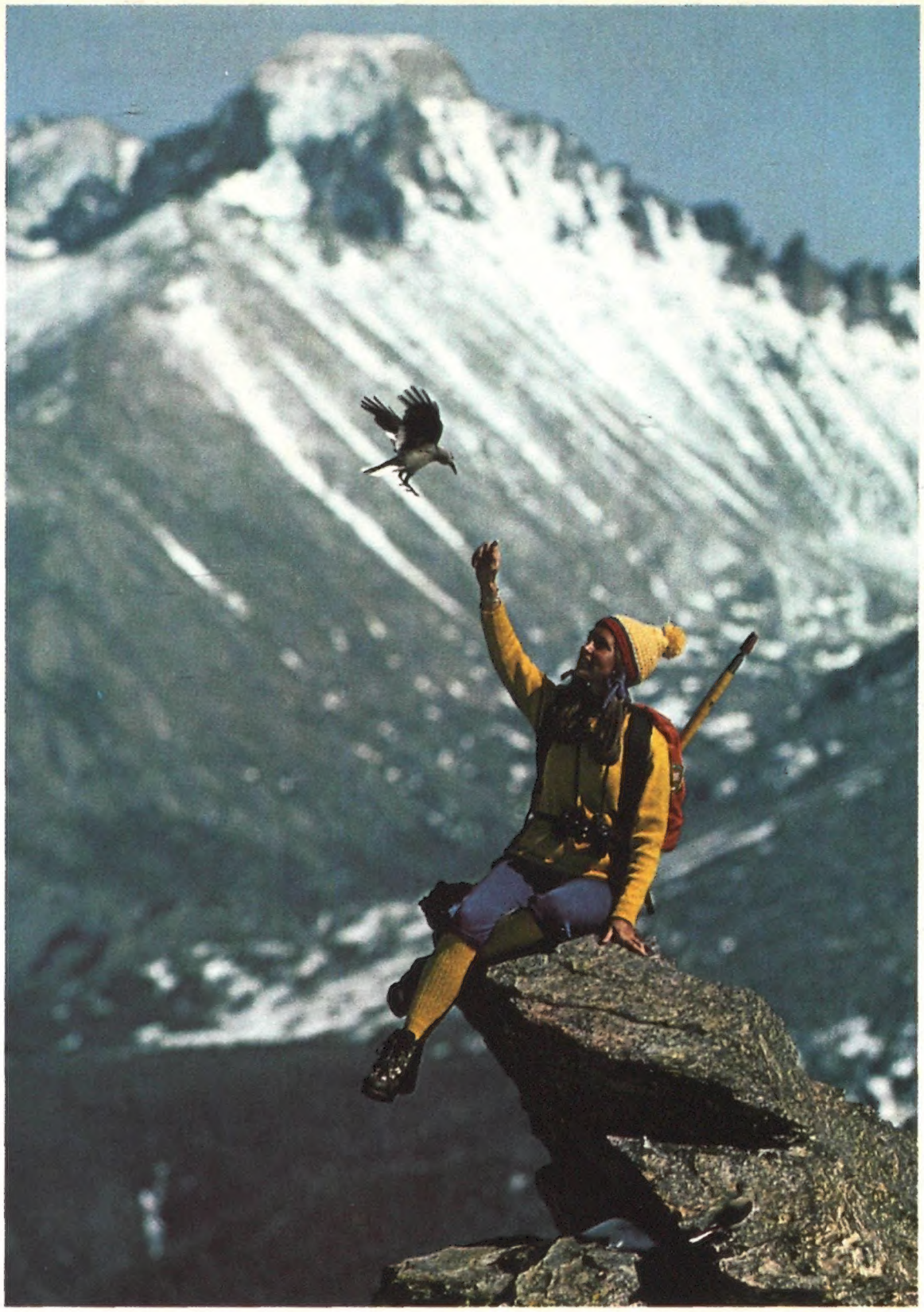


Working wife

This picture and the following letter arrived unsolicited.

Dear Kodak:

Thank you for inventing Kodachrome 64 film. It saved my marriage.

For six years I had been trying to capture the enclosed photo in Colorado's Rocky Mountain National Park. Optimum lighting required shooting on a clear afternoon around June 21, when the sun is farthest north in the sky. I needed freshly-fallen snow for a contrasting background. I also needed a stiff wind blowing from the west so that, if a friendly large bird happened by, it could fly in the direction I desired. The wind would give the bird extra lift to fly fairly slowly. But too hard a gale would ground my feathered subjects.

With a 300 mm lens, I had to maintain significant depth of field while shooting at a speed fast enough to freeze the bird's motion. I insisted on Kodachrome film for its unbeatable color and absence of significant grain. But Kodachrome II film's ASA of 25 did not give me enough flexibility to combine all these requirements successfully, despite years of futile attempts.

After losing two previous models, I solved the problem of coaxing a model into this picture by marrying the prettiest rock climber I could find. But as years passed, Donna tired of ascending this rock. She could endure the bitter wind at 12,000 feet. But the fresh snow always melted to refreeze as a sheet of ice over her route up the cliff. And I pointed out that a protecting rope would spoil the photo's drama.

Finally, Donna delivered an ultimatum. She would climb the cliff once more. If I did not get my picture this time, I must choose: give up the photo or give up her.

I had been working on this photo for six years. I had been married only four. What choice would any dedicated photographer make?

But for the first time, I was using Kodachrome 64 film. The extra speed of this great film gave me the flexibility needed to capture at last a photo of the quality I had envisioned. Thank you, Kodak, for saving my marriage.

Sincerely,
Kent Dannen
Estes Park, Colorado

The lady, it now turns out, was helping bring in some income. We have purchased the right to use the picture to suggest to others the possibility of imaginative originality in family photography, even without getting that close to Long's Peak, the tallest in Rocky Mountain National Park. Two additional points:

1. Matching Mr. Dannen's enthusiasm for Kodachrome film, some other serious photographers are just as enthusiastic about Kodak Ektachrome 64, 200, and 400 films. The latter two provide even more speed and are less demanding in their processing requirements. You can even process them at home. Might be fun. Ask your dealer.

2. The bird is a Clark's nutcracker (*Nucifraga columbiana*). The species nests below treeline but obviously can be lured above it by memory of past rewards from an extended human arm. There's a second on the rock. See it?

© Eastman Kodak Company, 1978

"WE SPENT SO MUCH TIME TEST DRIVING THE AUDI 5000 IN AMERICA, I ACQUIRED A TASTE FOR CHEESEBURGERS."

DR. HANS SASSOR, CHIEF OF NORTH AMERICAN TEST PROGRAM

How do you like them? Rare, medium or well?

Sassor: Medium to rare. But that's not the same thing everywhere in the U.S. In San Francisco, medium-rare came out rare. In Texas, they really cook the meat. But on the East Coast, I got medium-rare more often. Your burgers are as different as your driving conditions.

How many cars did you test here? And for how long?

Sassor: The test cars were here for nine months in 1977. These 100 prototypes were driven for one and a half million miles all over America and Canada. It was all very tiring, but exhilarating. North America is such a magnificent continent.

What did you find different about driving in America?

Sassor: The weather conditions. North America has greater temperature variations than we have. It gets terribly hot in the southern states. Just thinking of Texas makes me warm. That kind of extreme heat affects the engine, transmission, brakes and cooling system. After driving the test cars in the southwestern deserts, we modified the engine cooling system for the severe heat. On the other hand, the cold weather of Canada and the northern states can be just as hard on a car. When we saw that you put much more salt on the roads than we do in winter, we developed a heavy-duty undercoating for the car.

So how did the Audi 5000 do in its American test?

Sassor: Very well. It proved extremely durable. And we were delighted with our 5-cylinder engine. It's as powerful and responsive as the engineers said it would be. We also made a point to test the car on the roughest roads we could find to make sure the suspension could withstand them. And it did. I hope the people of New York won't be offended if I say the potholes there were some baptism for the prototype Audi 5000s. We made over 50 modifications as a result of the tests.

Why did Audi go to all this trouble?

Sassor: We're well aware of what some Americans say about imported cars: "Beautifully made, but very temperamental." We don't want that said about the Audi 5000. We feel if you want to sell it here, test it here. I believe it's the only imported car ever to be tested so thoroughly in the U.S. From what we learned, we made an excellent car even better.

On that point, we realize the current exchange rate between the Deutsche mark and the U.S. dollar. We know Americans are becoming conscious of getting good value, especially in German cars. The fact is that some German luxury cars have gone out of reach of most Americans. So we wanted to give people here a well engineered car they would like and be able to afford. We did. The Audi 5000 is the largest German luxury car for the money; it's under $9,000.*

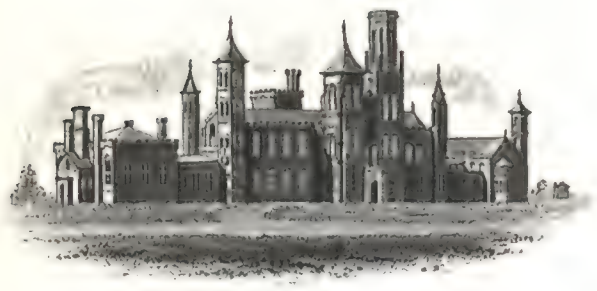
Did your test cars cause a stir here?

Sassor: Well, you know, we took off the insignia and nameplates. So nobody knew what the car was. And it's not the kind of car that stops traffic, any way. It's quietly elegant. And very beautiful. In fact, a man in Chicago thought it was a new Mercedes prototype. We didn't mind.

*Suggested 1978 retail price under $9,000 P.O.E., transp., local taxes, and dealer delivery charges, additional. Come in and test-drive the Audi 5000 at your Porsche+Audi dealer

Secretary Ripley's comments

The view from the castle



Small as it is, the oldest international conservation organization makes slow but perceptible progress in saving birds

Ohrid (pronounced ock-rid) is a town in southern Yugoslavia on the shores of the lake of the same name. Formed when a fault collapsed, Lake Ohrid is the deepest (down to 950 feet) and oldest (some 200,000 years) in Europe, has no outlet and is famed for its endemic fauna—one species of trout in particular—along with unique snails, insects, sponges and water plants (SMITHSONIAN, October 1973).

Town and lake were the setting recently for the 17th World Conference of the International Council for Bird Preservation (ICBP). This is the oldest of the international conservation organizations (founded in 1922), and it is supported entirely by volunteer efforts, a few foundation grants and, more recently, some much-needed help from the World Wildlife Fund.

Although the human delegates to such a conference need visas, unlike the world-ranging birds they hope to protect, representatives of about 25 of the Council's 62 National Sections managed to reach Ohrid from as far away as New Zealand and Indonesia, and from as close by as Hungary, Greece and tiny Malta. All came under their own steam, for enthusiasm far outranks money in the ICBP. The Italian delegation telegraphed that a car breakdown near Trieste had prevented their arrival, but "Please add our vote of appeal to the EEC." (The European Economic Community's council was to vote the next week on a measure outlawing among its member nations the killing of small migratory birds, a proposal which ICBP had helped to pioneer. As the Italians have been celebrated since Roman times for catching and eating small migratory birds, this absentee ballot was most welcome.)

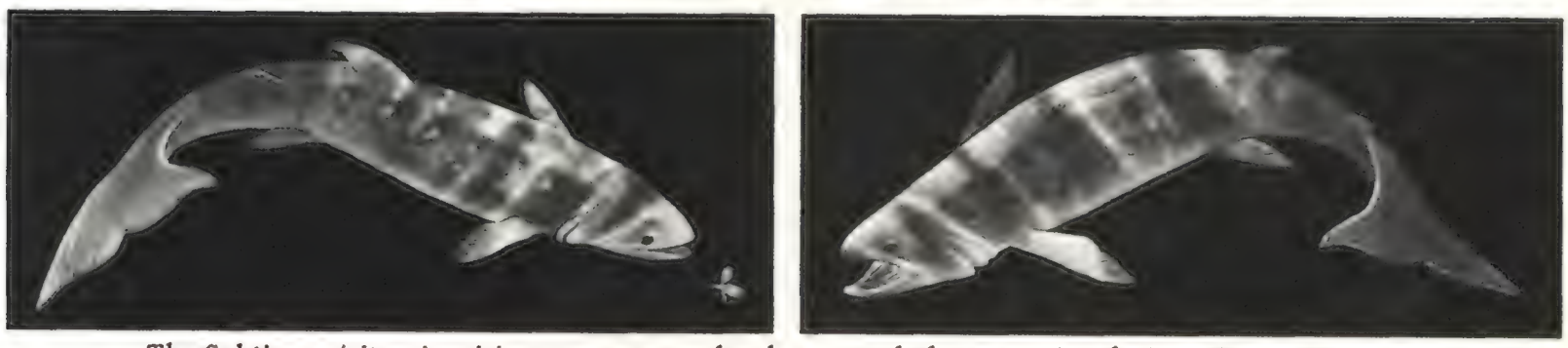
I have been President of ICBP since 1958, and have watched its increasing involvement in international environmental affairs with lively interest. The Council was among the first to warn of oil pollution before World War II, when sea birds were affected long before bathers on beaches became aware of the problem. Birds are prime "indicator" species, markers of environmental health. Their disappearance, or any population change, inevitably tells us something. ICBP, through its constituent sections, has been warning governmental agencies for years of the need for monitoring the aftereffects of pesticide and herbicide use.

What is fun about ICBP is perhaps its intimacy. Everyone knows everyone else; everyone is enthusiastic; and the slow but perceptible triumphs of heightened consciousness and responsibility, especially in the small countries, bring great satisfaction. After 2,000 years of trying to kill every migratory bird that might venture to land on Malta, spring or autumn, the Maltese now have an education program for young scouts, and hunters are being encouraged to take up clay-pigeon shooting in their gun clubs.

We also heard about the New Zealand Wildlife Service's rescue of an endangered flycatcher from a rat-infested island off the coast. Transplanted to another islet, the little group—only seven in all—was soon singing and nesting, and now there are nine. Is it any wonder that such a small organization is so soul-satisfying? To be able to *do* something practical about preserving nature and its disappearing species is an enduring thrill.

S. Dillon Ripley

Diameter 12" • Height 1½" • Glass designer: Paul Schulze • $6,000



The fighting spirit so inspiring to sportsmen has been caught by engraving designer James Houston, naturalist as well as artist. This example engraved by Ladislav Havlik.

Our speckled trout will surely catch your eye

Every Steuben engraved design has been executed by a master craftsman. To become a qualified engraver takes six years of apprenticeship.

In the case of "Water Disk • Trout," more than thirty hours of copper-wheel engraving go into every finished example.

A pair of speckled trout are engraved intaglio, or below the surface of the glass. Result: A three-dimensional concave sculpture.

On the face of the disk, a fly is engraved.

Subtly sculpted concentric rings create a moving, shimmering, waterlike surface.

Through refracted light the trout dart upward, real enough to catch.

The effect is one of movement and depth.

One in a series commemorating great game fish, Steuben's "Water Disk • Trout" is framed in sterling silver and lined in blue moiré silk.

See it now at the Steuben Gallery, 717 Fifth Avenue, New York, N.Y. 10022. (For the new 1978-1979 Steuben Catalogue, to be mailed early November, send $3.00.)

Steuben is part of Corning Glass Works, and has been since 1918.

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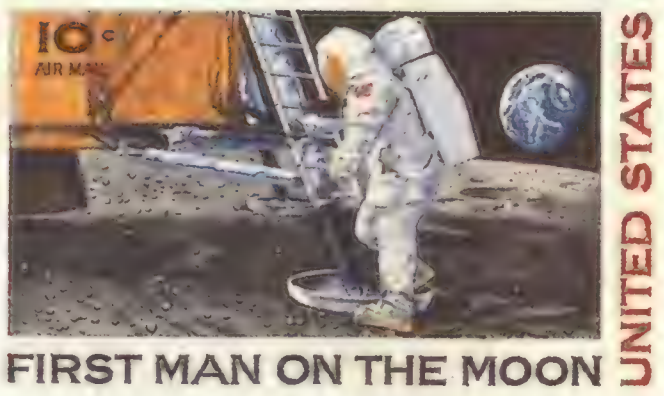

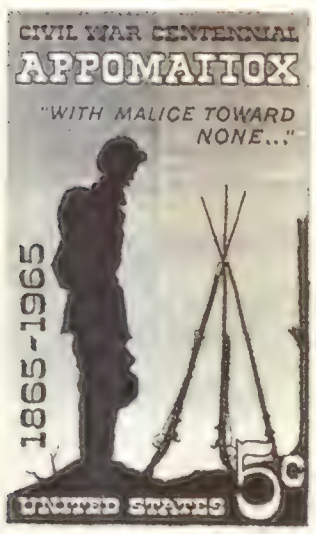

You could devote a lifetime to stamp collecting — and still not have a collection as magnificent as this one. Imagine owning 200 of the twentieth century's most historic U.S. postage stamps — in mint condition, as originally issued by the Post Office (20, 30, 40, 50 years ago). Imagine each of these stamps preserved in its original state forever — within a clear capsule on a beautifully-engraved commemorative cover, bearing an important anniversary postmark.

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Because these stamps are so historic — and because so many of them are difficult to obtain in mint condition — a new and exciting kind of commemorative cover has been designed to complement, showcase, and protect the stamps in this collection.

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In each case, the historic U.S. postage stamp itself is placed under a clear protective capsule, where it will be safe from dirt, dust, loss, and accidental mishandling. Elsewhere on the cover, the U.S. Postal Service will officially apply the anniversary of First Day of Issue postmark—which will give your covers an added collecting distinction.

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Each cover PERSONALIZED with the collector's name and address, if desired.

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As you know, United States commemorative stamps are prized collectibles the world over. These stamps provide a sweeping view of every facet of American history and achievement. Each stamp bears an outstanding work of art — specially commissioned from one of America's most outstanding artists, to dramatize the importance of the subject commemorated.

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To protect and display the complete collection, each subscriber will receive a custom-designed, handsome Collector's Album, at no extra cost. Thus, you may store your covers safely and display them conveniently

(Continued on next page.)

(Continued from previous page.)

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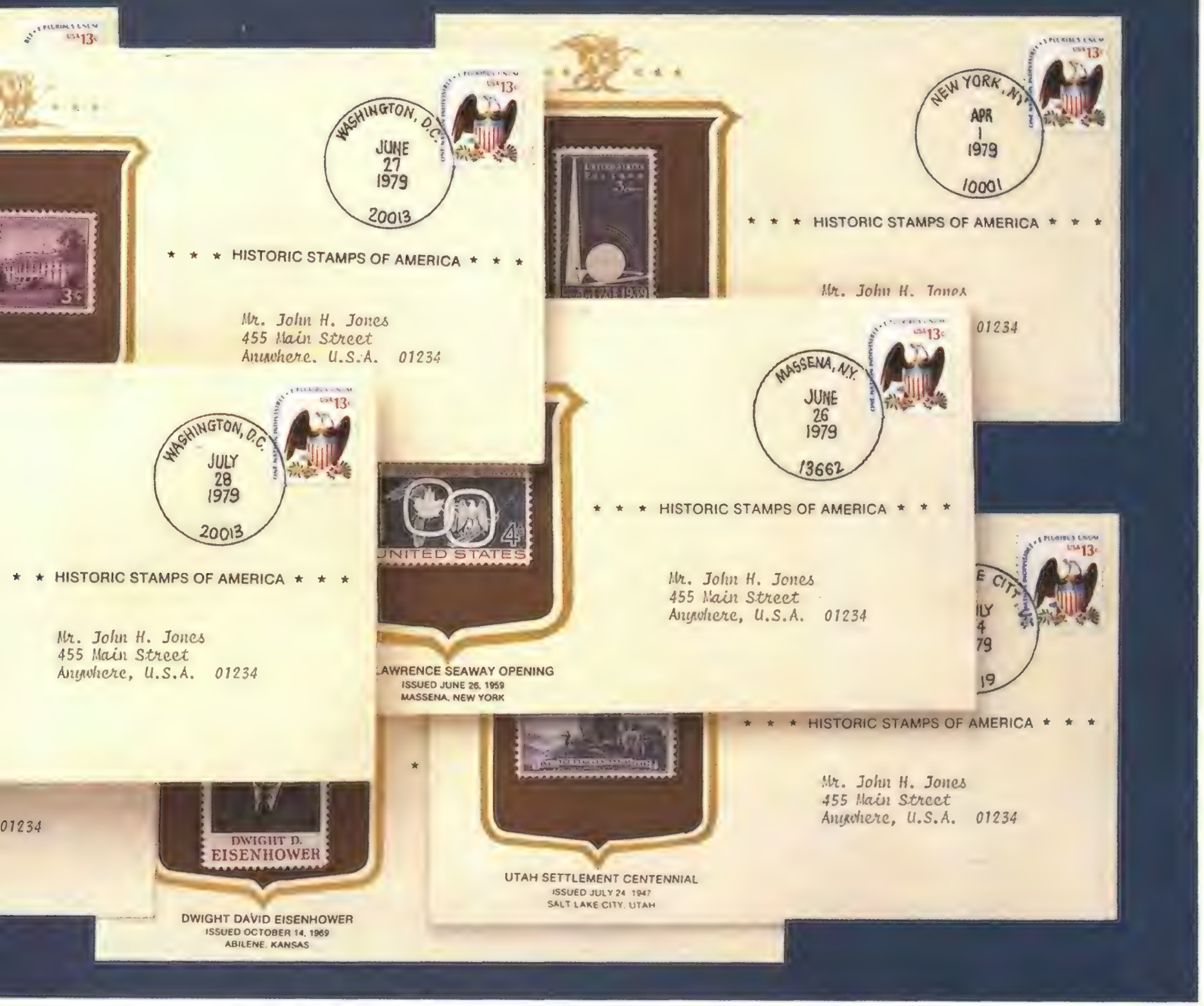

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Around the Mall and beyond

Washington turned on one of its hottest July days when Mrs. Carter handed her Inaugural gown over to the First Ladies exhibit at the Museum of History and Technology. But she remained serene and even-tempered as she told her hot, messy, uncomfortable audience how she had worn it to two Inaugural Balls—the first one when her husband became Governor of Georgia in 1971. She spoke pleasantly and expertly and she won my heart by being brief. I had put on a necktie for this affair, but thanks to this thoughtful First Lady, I was able to get it off again in record time and back on the rusty nail where it belongs.

Mrs. Carter arrived promptly and without any great stir, whisking up to the museum's Mall terrace in an unobtrusive White House car. Secretary Ripley met her and introduced her with the remark that she was carrying on a tradition that goes back to the Taft administration, and that the First Ladies exhibit produces more worn-out carpeting than any other in the Institution.

Mr. Ripley was on hand early, thanks to the remarkable vehicle at the right. It's the Rolls-Royce that belonged to the Beatles and is headed for the Smithsonian's Cooper-Hewitt Museum in New York, where it will appear, starting October 3rd, in an exhibit called "Ornament in the 20th Century." While it sojourned in Washington, Mr. Ripley was determined to drive it. Getting from the castle to the First-Lady ceremony gave him his chance, so he took off in it with our new Under Secretary, Michael Collins, in the copilot's seat.

Car buffs should note that the Rolls is a 1965 Phantom V Touring Limousine

Mrs. Carter (at rostrum) presents her Inaugural Ball gown to Museum of History and Technology. Secretary Ripley is seated at the center.

Awaiting shipment to the Cooper-Hewitt, where it may inspire other musicians, the Beatles' Rolls-Royce Phantom V rests in a Smithsonian parking lot.

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Fly-powered plane exhibits, single- and twin-engine, are Smithsonian's smallest.

and that the paint job was accomplished by Beatle John Lennon along with a friend of his, a Gypsy mystic, naturally.

Mr. Ripley reported that the car drove beautifully, paint and all, except that it's a little like a truck. He enjoyed the horn which plays, I think, the first two bars of *Lili Marlene*.

The "Flying for Fun" display which now occupies the west end of the National Air and Space Museum opened with an early morning coffee party. I arrived along with the sweet rolls and began having fun right away, despite the hour. Here is a bright pastiche of hang gliders, sailplanes, model airplanes, Frisbees, boomerangs and kites. There are marvelous films of soaring and hang gliding; there is a big, complex mobile of scale models.

Among the aircraft is an Aeronca C-2, a tiny, basic single-seater that used to putt around airports in the 1930s. It was the cheapest production plane ever built—$1,495 when it came out in 1929 and down to $1,245 in the depths of the Depression. The Aeronca was designed to be an aerial flivver—everyone's aircraft. And though you cannot look at this one (the last in the world, we think) without wanting it for your own, it was, honestly, a a fairly rotten little plane.

Hanging far above the floor is the winner of the 1976 Smirnoff Sailpane Derby, the only coast-to-coast air race held annually in the United States. The event is also the world's longest sailplane race, and its winner, like this one, is always beautiful. In most kinds of racing, speed results from practical and technical requirements; looks aren't considered. Even sailing races, except for class events, are now battled out by hulls that often seem strangely awkward if you are used to the well-verified beauty of traditional sailboats. But in order to stay aloft for hours at a time without an engine, and to go like hell to boot, a sailplane just has to be sleek and slender and exquisitely proportioned. Beauty is speed to a sailplane, and hooray for that.

There are lots of flying models in the display, some powered by complicated engines and controlled remotely. Two are

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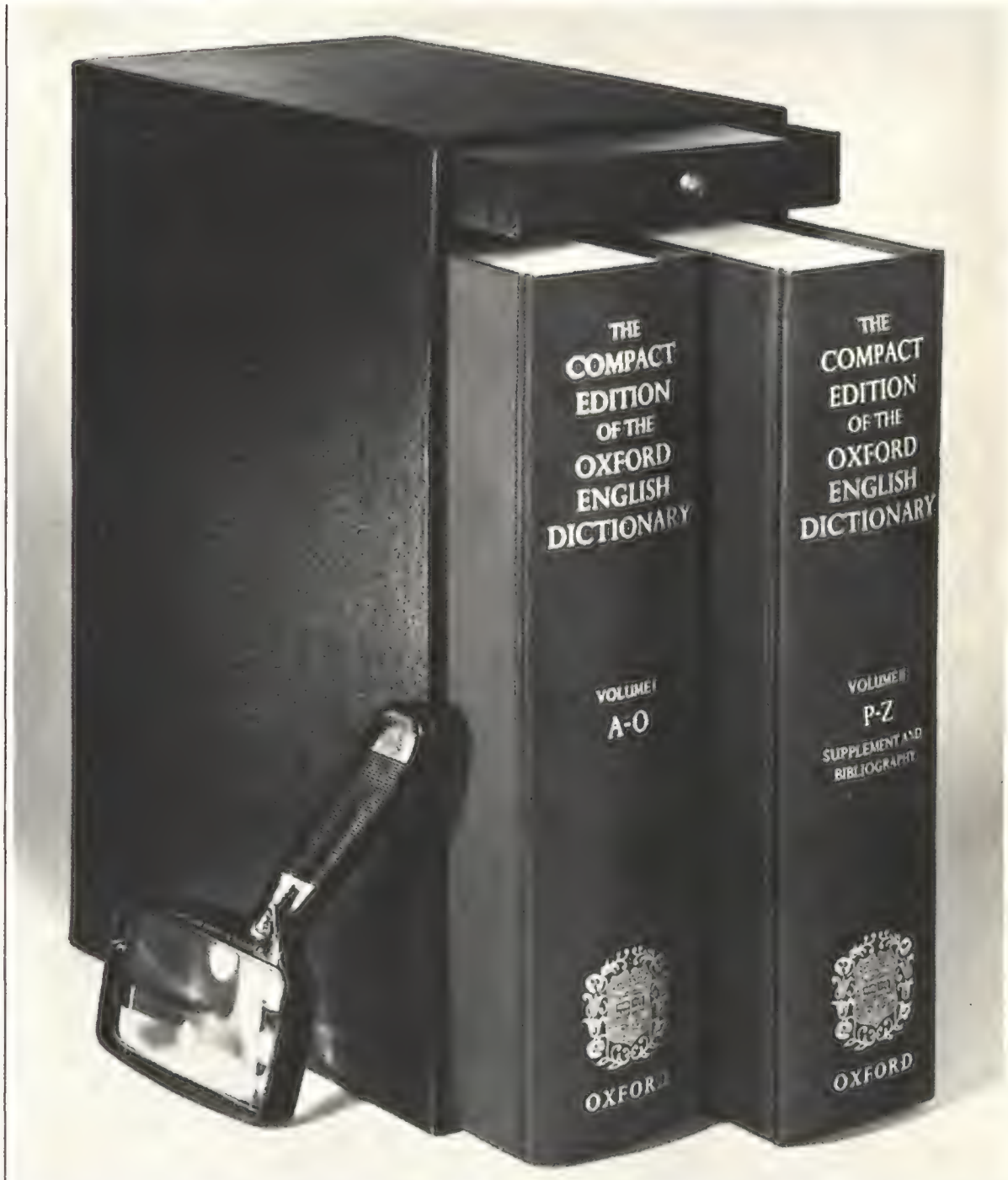

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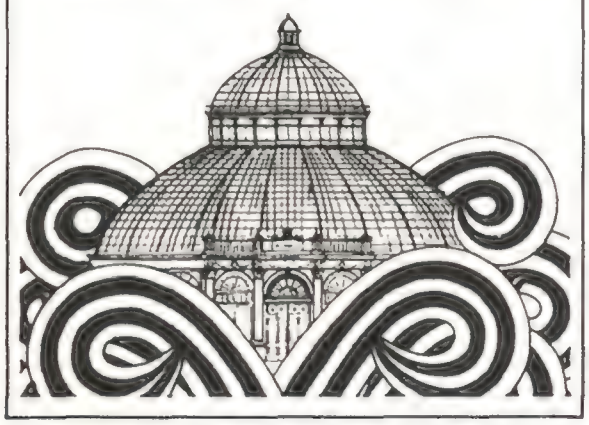

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fly-powered, and they're shown on p. 18. Claudia Oakes, who set this entire exhibit up, believes that these gliders are the smallest flyable displays in all that three-block-long museum. You can judge their size by comparing the flies in the photograph with your own. They are just houseflies like those you find on your screens.

I don't know if Boy Scout badges can be earned by building your own fly-powered plane, but just in case, here's how to go about it. First you catch your fly. Then you fashion this simple design with a sliver or two of balsa wood and some tissue paper and you glue your fly's little feet into position. Then turn him loose.

If you're building the twin-engine model, of course, you'll need two flies, but be sure they're nicely matched.

Cruel to the flies? Nonsense! Getting up in a tiny little airplane would be more fun for them than getting swatted on the kitchen linoleum.

A great deal was written about *ISIS,* the giant sculpture that was raised in front of the Hirshhorn as a gift to us Americans from the Institute of Scrap Iron and Steel. Mark di Suvero got creative with giant I-beams and a ship's prow and other mighty elements of . . . er . . . junk that had been deposited (I almost said "dumped") on us to commemorate the Institute's 50th anniversary.

I joined the noontime rubbernecks to ooh and ah at his creation and I was determined to play the part of a good journalist and get a few words straight from the artist. I watched the procedure carefully. There were a couple of long-haired, bearded men in hard hats riding a cherry picker around. There were another couple in hard hats, with beards and long hair, running the two cranes. There was a guy with a beard and a hard hat and long hair who was directing the operation from the side. And there were at least three others who had long hair and hard hats and beards who were helping and shouting and looking at girls.

"Hey," I said to a friend who had been watching for a long while, "which one is the sculptor?"

He paused to applaud as the end of an I-beam slid miraculously through the slot that had been torched out for it in a piece of . . . umm . . . junk. "He's the one with the long hair and the beard," he told me. "The one wearing a hard hat."

—EDWARDS PARK

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Letters to the Editor

Redwood forests

Dear Sir: Even though it has been a good many years since I lived near enough to make frequent visits to the California redwood forests, described in your July issue, I still have vivid memories of a lowly creature called a "banana slug," [see below] which seemed to monopolize the surface ground.

There may be other snails there, but the banana slug surely is the most visible—perhaps because it is so colorful.
Robert Wernick
Paris

Dear Sir: The "mill-bound redwood" is, in fact, a Douglas fir (*Pseudotsuga menziesii*).
James A. Blake
University of the Pacific
Dillon Beach, California
Readers who thought it was a Douglas fir or a hemlock were wrong, along with SMITHSONIAN. *For correct identification, see below.* Ed.

Dear Sir: Your photograph of a "mill-bound redwood" is actually a Sitka spruce (*Picea sitchensis*), and the Jedediah Smith Redwoods State Park is at the northern end of the national park, more than 100 miles from where the chain-saw vandalism took place.
Anthony Combs
Crescent City, California

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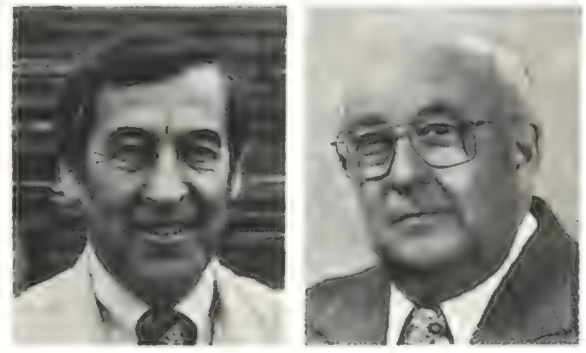
Dear Sir: In his article on redwoods, Robert A. Jones states that there are a few obscure signs designating the park, but he doesn't say that there is a section of the original highway, known as the Avenue of the Giants, which is now by-passed by the freeway. The land there has been bought up over the years with help of the Save-the-Redwoods League. Anyone wishing to see prime redwoods and ecosystems has only to leave the freeway and travel this section.
William R. Sharp
Petersburg, Alaska

Dear Sir: We were deeply disappointed in the Redwood National Park article—after all the time our Lowell Chapman and Burnette Henry gave your writer and photographer, you published a photograph of Burnette Henry, president of Arcata Redwood, and captioned it Lowell Chapman!
Gene Elsbree
Arcata National
Menlo Park, California
Mr. Elsbree is correct. In photographs below, Mr. Henry is on the left, Mr. Chapman on the right. Ed.



Dear Sir: It would have been enlightening to your readers if the author had mentioned that nurseries of major lumber companies produce approximately 20 million seedlings annually, enough to reforest 16,000 acres. These nurseries furnish many thousands of seedlings to private landowners and to the government for reforestation. In 40 years, these seedlings will grow sufficiently to be harvested.
J. H. Razzeto
Eureka, California

Dear Sir: I was glad you acknowledged that redwoods do regenerate. They grow from stump sprouts. About the only way to kill a redwood is to put it in a park and let it die of old age.
Edward Burgess
Zenia, California

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Radio telescope system (VLA)

Dear Sir: I read with fascination John Neary's article about the VLA eavesdropping on the universe. As I looked at the rows of observing platforms, I was reminded of Stonehenge. Perhaps someday in the faraway future, others may look in wonder at what we've left behind.
Jane M. Hurt
Nashville, Tennessee

Dear Sir: Your article on the Very Large Array was full of curious and fascinating phenomena observed by the world's biggest telescope, but my curiosity is piqued by something else: I'd like to know how tall photographer Shorty Wilcox is?
Deborah A. Lee
Chicago
He is 7 feet 1½ inches tall, and he enjoys having his picture taken where his skyscraper height dwarfs the average man or beast (see below). Ed.

Shorty astride a Swedish wild horse

Gorillas

Dear Sir: Regarding Maxine A. Rock's article, "Gorilla mothers need some help

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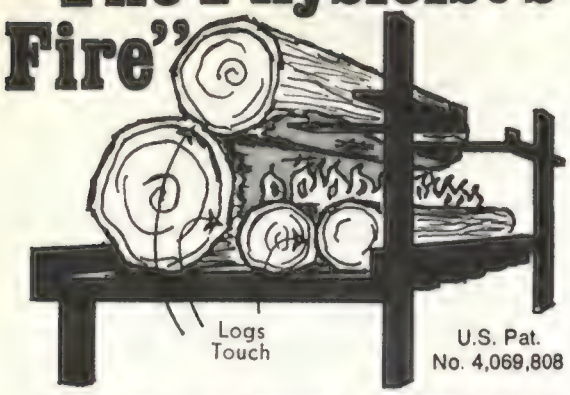

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from their friends," it is a pity that physicians and psychologists must learn from gorillas what they wouldn't listen to from their human patients. Young mothers have been suffering from isolation ever since the advent of those mother-in-law stories that are still making the rounds. The stories have caused young women to feel that their mothers will not be welcomed by their husbands, and they are a little afraid of their husbands' mothers. The mothers-in-law, on the other hand, have been brainwashed into believing that any effort on their part will be considered interference by the young people.

Human beings are social animals, and to be deprived of a satisfying environment is to invite such problems as child abuse.
June Swenson
Bowbells, North Dakota

Dear Sir: The problem of child abuse by the mother gorillas arises because of the way Man interferes with the animal's pattern of life. If there were no isolation cages in the first place, there would likely have been no gorilla child abuse.

Child abuse in the human is a complex phenomenon. The implication that human mothers abuse their children because they are lonely is often true, but not always. Child abuse often occurs because the parent feels that the child who is not sufficiently punished will be spoiled. It occurs because the parent was brought up by physical abuse and simply does what he or she knows how to do. Basically, child abuse occurs because we are a violent society.
Richard A. Behan
Larcas Community Clinic
Los Angeles

Botanical Garden

Dear Sir: Paul Trachtman's article on the New York Botanical Garden is a well-deserved tribute to some spectacular efforts for preservation "of the people, by the people, for the people"—which left some of us, like Dr. Britton, a little green with envy.

The sanctity of age and beauty are too often overlooked, forgotten, destroyed. Three cheers for the NYBG and several more for those whose foresight, will and money served to prevent the extinction of a glass elephant.
Paula Kowalewski
Brookline, Massachusetts

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Ginsberg

Dear Sir: I am writing to express my dismay at the tone of Edwards Park's article, "The Ginsberg caper: hacking it as in Stone Age." I do not doubt the scientific merit of the experiment, and the data seems to have been carefully collected. However, the flippant attitude of the writer (and, by inference, the experimenters themselves) combined with the raw emotionalism and indulgence of violence, which the writer and experimenters seem to share, strikes me as an unsatisfactory way to conduct and report a scientific experiment.

Carol A. Quinn, M.D.
San Diego

Dr. Quinn by no means represents a unanimous opinion. Only just as this issue was going to press, a Park fan club, represented by the Art Dealer & Framer *chapter of Alton, Illinois, with five members, appeared in* Smithsonian's *Washington office to present him with a T-shirt emblazoned "Preserve Edwards Park." We, with the Saints (the ones the Irish entreat to preserve us), intend so to do.* Ed.

Around the Mall and beyond

Dear Sir: I enjoyed reading about Secretary Spencer Baird and the possibility that birds may nest in the cupped right hand of his statue. It would be fitting.

The reference to the fact that the mocking bird *(Henricus Mimus polyglottis)* is named after Joseph Henry makes glaring the omission that so far as we in Alaska are concerned, Baird's memory is perpetuated in the naming of *Chionoecetes bairdi,* the larger of two species of Tanner crab. The smaller of the two species is named *opilio.*

Y. Brysconovich
Anchorage

Doñana National Park

Dear Sir: In your June issue, the figure of $420,000 given as World Wildlife Fund's land-purchase contribution refers to gifts from the United States alone. The total World Wildlife contribution to Doñana is $858,532, of which $803,113 was for land acquisition.

Russell E. Train, President
World Wildlife Fund—U.S.
Washington, D.C.

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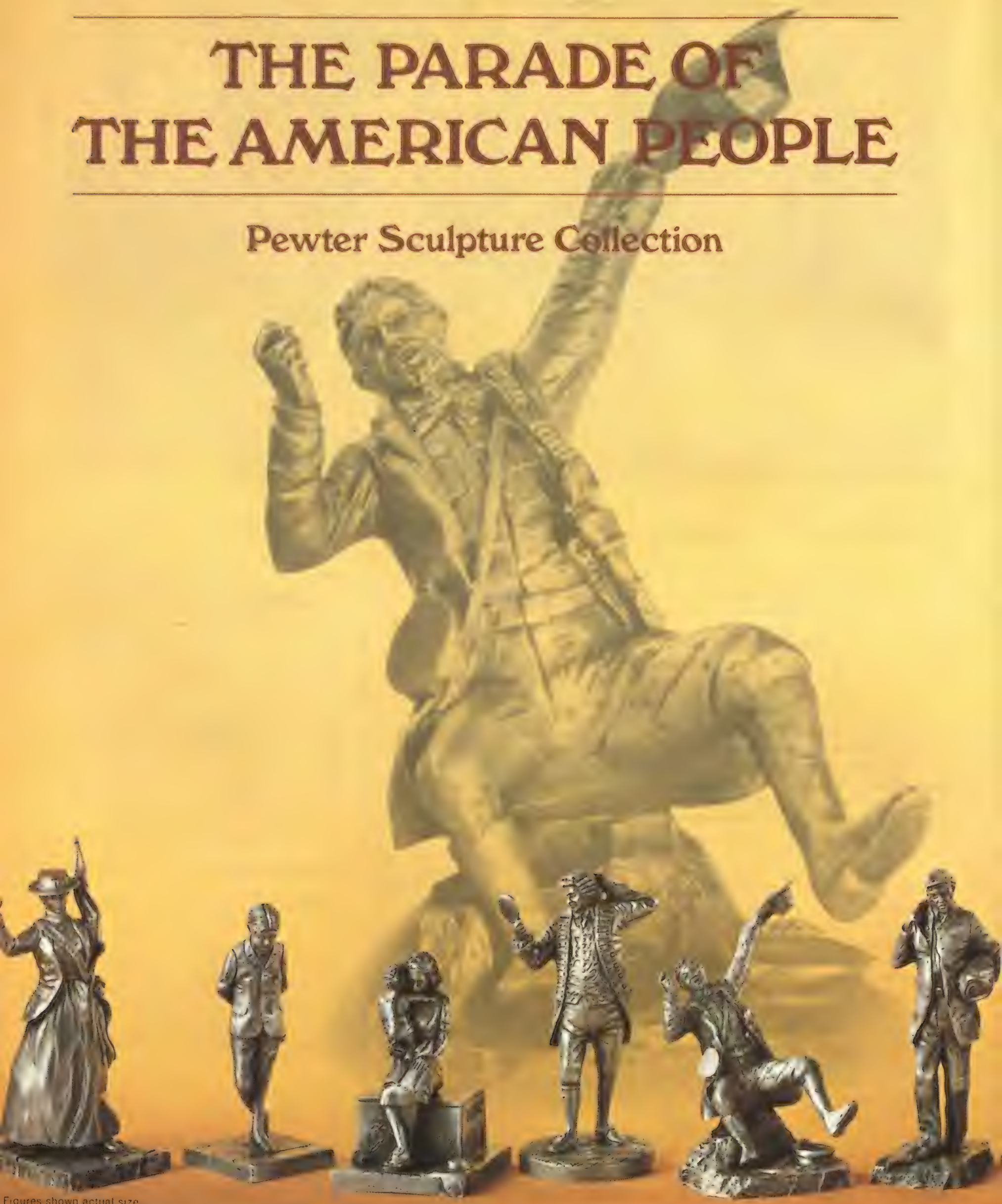

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Phenomena, comment and notes

Thoughts on the Indians' 'Longest Walk' to Washington, protesting—quietly—danger to their way of life

In mid-July about a thousand Indians, representing some 80 tribes, arrived in Washington at the end of their Longest Walk, from California to the Capitol, and engaged the attention of the local press for a week or so.

They were here to protest 11 major pieces of pending legislation they believe will effectively eliminate their way of life. The bills affect fishing and water rights, Indian sovereignty over their own lands, and in some cases "extinguish" the Indians' title. To this writer their purposes, in general at least, are valid.

In spite of the (to me) mildly ominous presence of the red braid-wrappings of the militant American Indian Movement, the Longest Walk was a solemn, peaceable and religious protest. They came, they said, with love, honor and respect, seeking the same for themselves. Elders, women, children, babies born on the trek, familiar militant faces—they all stopped in Malcolm X Park as they walked into Washington, seeking a spiritual coalition with the black community. Judging from the number of black arms raised in salute and the regularity of "right ons," the Indians got the response they wanted.

Dick Gregory, the humorist-turned-activist-but-still-humorist said he'd learned a lot from the arrival of the Indians. Both blacks and Indians are always late: the difference is that blacks worry about it. He said if the trekkers had wanted more press for their long march, they shouldn't have billed it as a prayer, but should have thrown beer cans around. But never mind, said Gregory, there was a force at work greater than public relations in this venture; the moon and sun don't get much press either, but those bodies have considerable power. I can't imagine the elders weren't smiling behind their impassive faces.

There were no security incidents except that a high official of the Department of the Interior, a Navajo, was denied entry to his office by Interior guards nervous that the Indians might try to take over the Bureau of Indian Affairs, as they did the last time they came to town. The official, greatly amused, took the day off.

Throughout the week, the Indians talked about survival—their own—and as I listened to the speeches, endless speeches in the manner of Indians, I kept thinking about an old Hopi man my wife and I spent some time with once. For reasons of privacy, I'll call him Ralph. He is about 75 years old and shorter even than most Hopis. When we first met him he was building the heavy stone walls of a house on one of the high mesas of northern Arizona, where the Hopis have lived at least since about A.D. 1100. Later, we spent a day driving around to see some old ruins to the west of the reservation that Ralph had never seen. One of these, Tuzigoot (p. 38), was of particular interest to him because it was where his clan had come from a millennium ago.

By virtue of his clan, Ralph explained to us, he is the keeper of the tribal history. When a land dispute arises between villages or clans and there are conflicting accounts of whose ancestors got there first, Ralph is summoned and his account of the ancient facts settles the matter. This is oral history, of course; Ralph's uncle told him all the history when he was a small boy.

The first ruin we went to, researched and preserved by the National Park Service, was Wupatki. Ralph's uncle had told him about this place; it was where the Hopi women's dance had originated. In a Lysistrata situation, the women of Wupatki had grown angry at the men for gambling instead of farming and had built their own kiva, with a tunnel to it from the chief's house so they would not have to associate with the men.

"There," said Ralph, pointing to the

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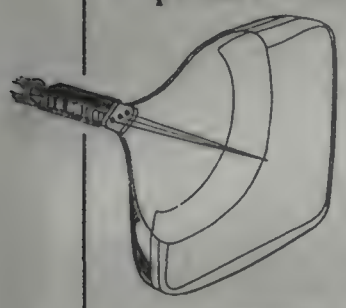

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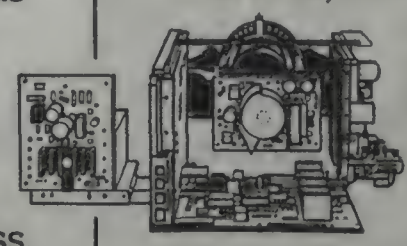

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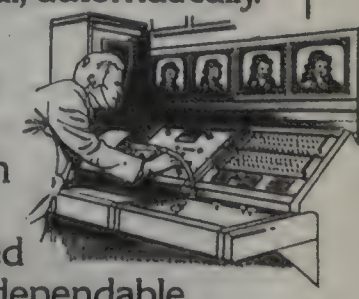

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round room built into the ground, "thats the women's kiva." And marching up to the remains of the pueblo buildings sitting on a knoll above the kiva, he identified the chief's house.

"But where's the tunnel?" he asked. "It should be right here." And he began to dig with his hands, throwing aside dirt and stones until soon he found some stonework. "There it is," he said, satisfied. "The archaeologists didn't find it. They should have talked to me." We drove triumphantly to Tuzigoot.

When his clan left Tuzigoot, Ralph explained, they left a live infant in one of the chief's rooms so that they would always have the right to return. At the little museum-reception center which the Park Service runs, the old man went up to a bored attendant and explained who he was and that his clan had originated there (information not given on the museum's exhibit identification placards). Then he asked if the baby was still there. My stomach rolled over a few times, expecting the worst from the smug-looking guard. But no, the guard hesitated and said that actually they *had* found the remains of an infant in the chief's room when archaeologists excavated the place in the 1930s. It had been reinterred out of respect, the guard said.

In fact, they had discovered several infants in the ruin, the museum brochure says, but Ralph found the chief's room, and found the place where the baby had been buried and he stood there a long time. Then he headed for the roof via a stairway that the Park Service had temporarily barred. I asked him about disobeying the Park Service's sign and he paused on the stairs, looked back with a cheerful glint in his eyes and said, "This is my place. It's all right for *me* to go anywhere here. Come on."

Later Ralph told me that, in the nature of things, it was about time for him to pass on the tribal history to a clan nephew. But none of his nephews, he said, was suitable. They were too much involved in the white man's world to have the patience to learn it. He was looking for a suitable young man, never mind if he was really a nephew, to become the keeper of the Hopi truths. I don't know if he has found one.

It is my opinion that, with neon lights beckoning them from the ambiguous status we have permitted them, native

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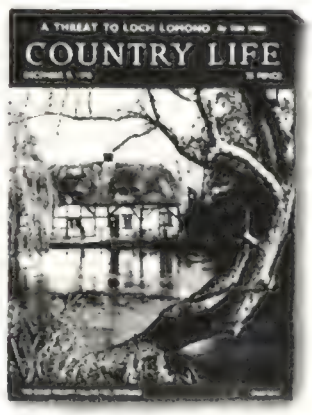

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people are having enough trouble holding on to their special ways of life without the rest of us throwing in new and unsettling ideas. I knew a young Indian whose suicide was attributable to this ambiguity.

It seems to me we have learned the value of preserving endangered species, even the lowliest, even if it costs us money and some favorite engineering project. There's a lot of economics involved in any such situation. And a considerable part of the United States' energy and water resources exists on reservation land. Treaties govern these lands.

A growing number of Americans believe that it's time at least to renegotiate the treaties in the spirit in which the Indians came to Washington last July, rather than to declare them all, legislatively, nonexistent.

Endangered species, it has been pointed out, cannot talk, so we humans must act in their behalf as a matter of honor if not self-interest. Native people *can* talk. Last July they were once again in Washington telling us that they, too, want to survive.

It's easy to get sentimental about such things of course, but it seems to me that sentiment is a necessary ingredient in love, honor and respect.

And self-respect.

JAMES K. PAGE JR.

Ruins of Tuzigoot, village Hopis left 600-900 years ago

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Now, on the occasion of its 250th anniversary, The Saturday Evening Post will issue a collection of miniature pewter sculptures that capture forever the rich and varied panorama of American life–from the Post's unique viewpoint. And you can examine the first sculpture in the collection without cost or obligation.

This collection, entitled *The Parade of the American People,* portrays the men and women of America through each of those twenty-five memorable decades. Our colonial ancestors, both pious and pompous. The courageous men and women who opened up the frontier–and those who stayed at home. The way we adjusted to the changing scene–the coming of the railroads, votes for women, the jazz age, radio and television. All captured with love, with faith–with the unique Saturday Evening Post touch–in these miniature pewter sculptures.

Each decade will be represented by two figures: a man and a woman, costumed in the dress of that decade, and portrayed in a manner reminiscent of that time. The result is a collection that will bring back the aura and atmosphere of *each* fascinating era of American life.

The people of America— in inimitable Post style

Each of these miniature pewter figures captures the feeling of the time which it represents . . .

The pompous Colonial merchant adjusts his wig and smugly admires himself in the mirror.

The Revolutionary War soldier pauses to pray during the long and hard winter at Valley Forge.

The pretty Southern belle, in an enormous hoop skirt, causes a minor furor when her frilly crinoline is upturned by a mischievous puppy.

A flapper of the Roaring Twenties borrows her beau's prized Stutz Bearcat –only to wind up pumping a flat tire.

The World War II G.I. "fights" the enemy and a pile of unpeeled potatoes!

And a young mother of the 1950s frantically searches through her copy of "Dr. Spock" for the answer to her little one's sobs.

Sculpted in meticulous detail

Each of the fifty figures will be an original work of art, created *exclusively* for this series by Ronald Hinote, one of America's most distinguished sculptors of miniature figures. Hinote's work is widely admired for its artistic quality as well as its devotion to accuracy.

Each article of clothing . . . each pose . . . each facial expression will be clearly portrayed–all the more remarkable considering the size of each figure. And each figure will have a special *style* about it–a lightness of spirit or a moving and inspiring quality–that has always typified the Post's approach to life.

You'll actually be able to see the bouquet of daisies held by the blushing young lad on his first date. The cartridge belt worn by the cowboy as he relaxes, secretly reading his favorite *poetry*. The frilly pantaloons worn by the Southern belle. Every detail will be captured with skill and artistry in these superb miniature figures.

To make certain that the figures are crafted to the highest standards of quality, The Saturday Evening Post has appointed The Franklin Mint to produce them. Each figure will be *hand-finished* to bring out every feature of the sculptor's work and the rich lustre of the metal.

Lasting beauty and rarity

Since *The Parade of the American People* will be produced in a single strictly limited edition, it will have assured rarity. There is a limit of one subscription per person, and the total edition will be forever limited to the exact number of individuals who subscribe by the deadline date of September 30, 1978.

To add to its artistic value, each figure will bear the distinctive signature mark of the sculptor as well as the prized mintmark of The Franklin Mint.

As a subscriber, you will receive these handsome figures at the convenient rate of one each month. The price for each pewter sculpture is just $19.50, and you will also receive, without additional charge, a hardwood five-tiered cabinet–custom-designed to display the complete collection on the wall or on a tabletop. In addition, a fascinating commentary will be provided with each figure. And a *special magnifier* will also be sent for close-up examination of each figure.

Examine the first figure without cost or obligation

By special arrangement, The Franklin Mint will make the first pewter figure available for examination, on a strictly limited basis. If you wish to take advantage of this unique opportunity, you must respond by September 30, 1978.

The first figure–*Colonial Pride*–will be sent to you without any advance payment and you may keep it in your home for 10 days. Only then need you send your payment for it–and subsequent figures will be issued at the rate of one per month. Should you decide not to keep the first figure, you may return it within 10 days. It will then be destroyed to protect the rarity of the collection.

To examine the first figure, mail the form below to The Franklin Mint by September 30th.

A handsome hardwood five-tiered cabinet will be provided for display of the complete collection of miniature pewter figures.

ORDER FORM

THE PARADE OF THE AMERICAN PEOPLE

Pewter Sculpture Collection

The Franklin Mint
Franklin Center, Pennsylvania 19091

Please send me the first miniature figure in The Saturday Evening Post's *Parade of the American People Pewter Sculpture Collection.* I understand that I may examine it in my home for 10 days without cost or obligation. At the end of that time, I have the privilege of returning it and canceling my subscription if I wish. Or I will keep the figure and pay $19.50* for it and for each of the subsequent 49 pewter figures in the collection, as they are sent to me at the rate of one per month.

**Plus my state sales tax*

Signature_____
ALL ORDERS ARE SUBJECT TO ACCEPTANCE

Mr.
Mrs.
Miss_____
PLEASE PRINT CLEARLY

Address_____

City_____

State, Zip_____

Limit: One collection per subscriber
Must be postmarked by September 30, 1978

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A tribute to the human mind.

The Research Institute of our British company, Smith Kline & French Laboratories, Limited, has been granted a high distinction. It has received the Queen's Award for Technological Achievement, given in the United Kingdom in recognition of significant contributions to science and technology.

The award acknowledges our development of an entirely new therapeutic agent for ulcer treatment. The research leading to this new medicine spanned 12 years and involved highly original scientific thinking.

We accept the Queen's Award in a spirit of humility. We recognize that the honor it confers is, in the ultimate sense, a tribute to the creative powers of the human mind, not to any business institution.

We view our substantial financial investment in our worldwide research programs as a way of enabling human inventiveness to continue making discoveries that will benefit human health and well-being.

The emblem of the Queen's Award for Technological Achievement. The award recognizes outstanding examples of innovation in science and technology with practical applications in Great Britain. It was established in 1965 and is given annually.

SmithKline
CORPORATION
Philadelphia, Pa.

This program is endorsed by the U.S. Olympic Committee. Every First Day Cover you buy helps the Olympics and the U.S. Olympic Team.

Moscow—host city to the 1980 Summer Olympic Games—and the Lenin Central Stadium, which seats 103,000 spectators.

Tallinn—known as the 'Museum City, because many of its buildings date from the 10th Century—will host the Regatta.

Kremlin—the cultural and political center of the U.S.S.R. dates back to 1147 A.D. The striking dark red stamp is exceptionally large.

COLUMBIA HOUSE, A DIVISION OF CBS, INC. ANNOUNCES

THE OFFICIAL COMMEMORATIVE FIRST

Sanctioned by the Organizing Committee of the 1980 Olympic Games in Moscow and endorsed by the U.S. Olympic Committee.

Beautifully engraved First Day Covers illustrated by leading artists, each bearing an official Soviet Olympic stamp, postmarked in Russia with the specially designed First Day of Issue cancellation.

THIS IS A STRICTLY LIMITED EDITION: ONLY 60,000 COMPLETE SETS WILL BE AVAILABLE WORLDWIDE.

On July 19th, 1980, a mighty roar will fill the Soviet Union's V.I. Lenin Stadium as a lone runner enters the great arena—the last of a relay of hundreds of jubilant men and women carrying the precious Olympic Flame from Olympia, Greece, over thousands of miles and through many countries.

Then, cheered by more than 100,000 officials, athletes and visitors from all over the world, together with an estimated two billion television spectators watching via space satellite, the flame will light the official Olympic torch, to burn every hour during the 16 days of the summer Olympic games as a symbol of universal brotherhood.

A thrilling way for you to share in the 1980 Olympics

To enable the people of every land to share in the excitement and thrilling achievements of the games, the U.S.S.R. has created a magnificent series of seventy-nine beautiful First Day Postal Covers.

Each cover features a newly designed U.S.S.R. postage stamp beautifully portraying the Olympic symbol, city or sport it honors. Each Cover will be officially postmarked with a special Olympic design, on its first day of issue.

49 Covers will depict the games themselves, portraying the events in which the greatest of the world's athletes will compete...track and field, swimming, gymnastics. An additional 30 will represent the historic and exotic Soviet cities which will hold special events ...the "Golden" cities of Moscow, Kiev, Leningrad, Tallinn, Minsk.

Limited editions of great beauty, significance and value

In addition to the original stamps and postmarks, outstanding illustrators have created a group of special engravings, known as cachets, which will be printed in full color on each Cover. As you can see from the first series of four Covers shown above, these illustrations are magnificent works of art, each truly worthy of the Olympic event or place they depict.

If you are already familiar with First Day Covers you will particularly appreciate the fact that only 60,000 complete sets of this collection will be sold worldwide. When you consider that First Day Covers commemorating events of much lesser importance and popularity often sell in the hundreds of thousands, you can recognize the value these limited edition Covers will have to collectors in the years to come.

Beautifully mounted and displayed in a custom-designed Presentation Album

Each Cover is printed on a luxurious vellum stock and will be delivered to you in its own display envelope, ready for mounting on a sturdy album page. The reverse of each Cover bears a Certificate of Authenticity, signed by Vladimir Koval, Vice President of the Moscow Organizing Committee. In addition, each album page will provide you with colorful background information about the event, symbol or place commemorated by that First Day Cover.

Specially designed cancellation for the "First Day of Issue" adds greatly to the beauty and value of each cover.

Official Olympic Stamps of the Soviet Union, host country for the 1980 Summer Olympics, beautifully depict the excitement and color of this historic event.

The Olympic Flame will be relayed from the ancient ruins of Mt. Olympia across Europe thousands of miles to Moscow.

Original engravings designed by leading illustrators excitingly capture the spirit of the games, host cities and Olympic symbols.

Printed on luxurious vellum envelope stock—with a Certificate of Authenticity from the Organizing Committee of the Olympic Games on the reverse.

Deluxe Presentation Album to protect and showcase your collection, gold-embossed with the 1980 Olympic symbol. Sent to you without additional cost.

DAY COVERS OF THE 1980 OLYMPICS

Furthermore, you will also receive, without extra charge, a magnificent handcrafted Presentation Album, with matching slipcase. Bound in rich burgundy covers, gold-embossed with the 1980 Olympic symbol, the Album provides an elegant showcase to protect and display your collection permanently.

Free to Charter Subscribers... a Commemorative 1 Rouble Olympic Coin

With your first four Covers, you will receive absolutely without charge the one rouble Olympic Coin shown here. This is the first issue of several... engraved with the emblem of the 1980 Olympics...this memento is a legal tender coin circulated in the U.S.S.R. The Olympic coin is yours to keep, whether or not you decide to keep the first set of Covers.

As a Charter Subscriber you will be guaranteed the opportunity to own the entire set of First Day Covers, which will be delivered to you at the rate of four a month direct from Columbia House.

You are also guaranteed that the price of $5.75 per cover will be maintained for you throughout the series, regardless of any increases in market value that may occur as these limited editions Covers find their way into the philatelic and collectibles markets. You have the right to cancel at any time and relinquish your right to obtain all future Covers in this historic series.

Confirm your reservation now under our guarantee of satisfaction

We invite you to reserve your Collection now by mailing the Subscription Application supplied here. There is no need to send any payment at this time; you will be billed in advance of each month's shipment. Furthermore, you must be delighted with each set of four you receive or you may return them within 30 days for full refund.

Because of the beauty, significance, value and scarcity of the Olympic Covers, it is likely that the worldwide demand for them will quickly exhaust the supply. Once sold, they will never be reprinted. So be sure to mail the Subscription Application today.

***Special Note:** this Official 1980 Olympic Commemorative First Day Cover Collection is the only series to be officially sanctioned by the Moscow Organizing Committee and to bear its official cachets—and is not to be confused with any ordinary postal issue that may be circulating without the endorsement of the Committee.*

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Please enter my subscription to the Official 1980 Olympic Commemorative First Day Cover Collection, consisting of 79 covers. These will be sent to me at the rate of four per month, at the guaranteed price of only $5.75* per cover. I will also receive, at a future date, an elegant Presentation Album, custom-designed to protect and showcase the entire collection.

In addition, with my first four Covers, I will receive the one rouble Olympic Coin, which is mine to keep as a free gift, whether or not I decide to keep the Covers. I may return any set within 30 days for full refund.

I understand that I need send no money now. I will be billed for my Covers in advance of shipment.

*plus my state sales tax and $1.50 per set of four covers for shipping and handling

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1901
huehnergarth

By Keith Wheeler

First of two parts

The very inquisitive agency that takes America's measure

From suburban kitchen to scientific frontier, the National Bureau of Standards explores the long and the short of just about everything

The federal government's most concentrated, versatile and hyperactive reservoir of human brainpower functions comfortably enskulled within 575 acres of gracious Maryland countryside at the city of Gaithersburg northwest of Washington, and another 208 acres of Rocky Mountain foothills near Boulder, Colorado. Within these shelters some 3,100 scientists, engineers and technicians work at measuring everything that impinges on the human condition and beyond, into the infinities of the cosmos.

The range of their interests surpasses astonishment. Using for a tool a stuffed tennis shoe on the end of a stick, they probe under the housing of a rotary lawn mower to figure out how best to protect the toes of suburbia from being shorn off. Somewhere near the other end of the scale, they set a cesium-atom clock at Boulder to the task of measuring time to an accuracy of one millionth of a second a year—or less than a second in more than 300,000 years.

When not fully engaged with the mundane present —such as finding out that about 97 percent of a sampling of Boston-area homes are burdened with oil burners that are too big for the job and waste a lot of fuel—and probing the distant reaches of basic science, these assembled brains can and do tinker with such problems as tracing the geographical source of gold and silver in ancient coins, or they fiddle with the remote future by trying to duplicate the creative energies of their own living gray cells with microminiaturized electronic intelligence.

The name of this conglomerate of applied thought is the National Bureau of Standards, part of the Department of Commerce. Congress created it in 1901 to fill an imperative need for uniform systems of measuring nearly everything. It was high time. In an era when the nation was just emerging as a serious contender in international trade, a faculty member at the Rensselaer Polytechnic Institute complained that he couldn't determine how much any container actually held because he had to contend with eight "authoritative" versions of the gallon. Surveyors in Brooklyn were especially disadvantaged because they had to deal with four different legal feet: the U.S. foot, the Bushwick foot, the Williamsburg foot and the 26th-Ward foot—named for different parts of Brooklyn. The upshot was that considerable local real estate vanished from the tax rolls because, in the eyes of the courts, it had ceased to exist.

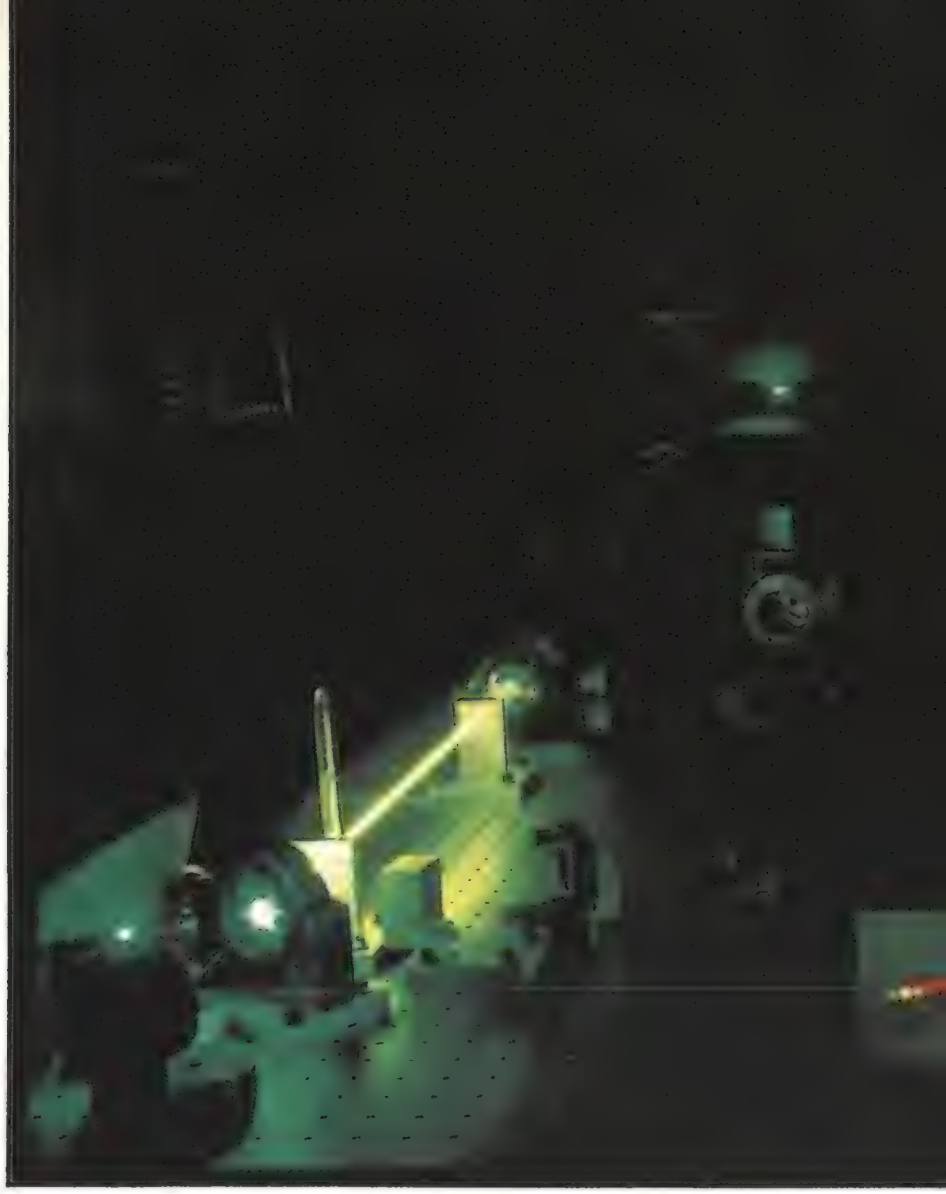
The enabling act authorized the new bureau to take custody of basic standards by which every quantity and quality applicable to science, engineering, manufacturing, commerce and education could be measured with uniformity. No more 26th-Ward feet. Having done this, the bureau would then furnish users with data and the means to calibrate their own tools and instruments so that everybody would be speaking a language that everybody else could understand.

The base standards, still firmly in force, are those for mass, length, time, temperature, luminous inten-

Here artist John Huehnergarth suggests how NBS has grown from modest origins in 1901. Today, bureau's probers scrutinize the harnessing of energy, the machinations of industry, the cooking habits of the housewife—and much, much more.

Photographs by Robert C. Lautman

A very inquisitive agency



In an NBS lab, a system of laser beams and mirrors creates pure colors whose wavelengths may be

While a researcher observes through one-way glass and on television monitor, meal is prepared in the bureau's experimental kitchen at Bowman House.

sity or light, electric current and the amount of a substance expressed in "moles"—scientifically handy measurements based on atomic or molecular weights. Using these fundamentals in different combinations, it becomes possible to establish measurement for phenomena such as force or power, wavelength, vibration, noise, voltage, humidity, fluid flow, and unit characteristics for hundreds of quantities and qualities vital to science or, for that matter, to the man who reads the electric meter on the citizen's garage wall. These are called the derived units of measurement.

The first sets of U.S. standards were replicas of the metric standards housed and certified by the International Bureau of Weights and Measures at Sèvres, near Paris. The standard for length was then a meter-long bar of platinum-iridium, an alloy chosen for its stability under changes of temperature. But as the demands of science grew more exacting, the bar of metal, minutely exact though it seemed, was no longer good enough. Since 1960 the meter has been defined in terms of the wavelength of light emitted by an element called krypton 86. Nearly all other standards have been similarly refined. Physical objects, once venerated as the holy icons of accuracy, have been replaced by terms defining the constants of physics and chemistry. The only prototype still on the shelf is the standard for mass, a one-kilogram weight of platinum-

used to set new standards of measurement. Some of colors are visible on card in center foreground.

iridium. Bureau scientists would like to find some standard a little better. The weight is not quite perfect, for the alloy can oxidize slightly or coatings can form on the surface, minutely affecting the mass. Still, it is pretty good; "secondary standard" weights of platinum-iridium or stainless steel—used to calibrate other instruments for weighing mass—are compared with it on balances precise to within a hundred-millionth of a kilogram.

At bottom, the science of measurement—metrology—and its continuing refinement down to smaller and smaller quotients of possible error is what the National Bureau of Standards is all about. "That is the heart of what we do and what we are," says Dr. Barry Taylor, physicist and chief of the electrical measurements and standards division in the NBS Center for Absolute Physical Quantities. "It is partially a matter of esthetics, but even more it's the belief that with each added decimal place we have a chance to learn something new and important about basic science."

This central business of adding decimal places goes steadily forward under the bureau's mandate to take charge of the standards and, when necessary, to construct new standards, their subdivisions and multiples. But one extra clause in its charter both handed the bureau another responsibility and, as it has turned out, bestowed on it enormous discretion to inquire and to act. This paragraph enjoins NBS to determine the "physical constants and the properties of materials when such data are of great importance to scientific or manufacturing interests and are not to be obtained of sufficient accuracy elsewhere."

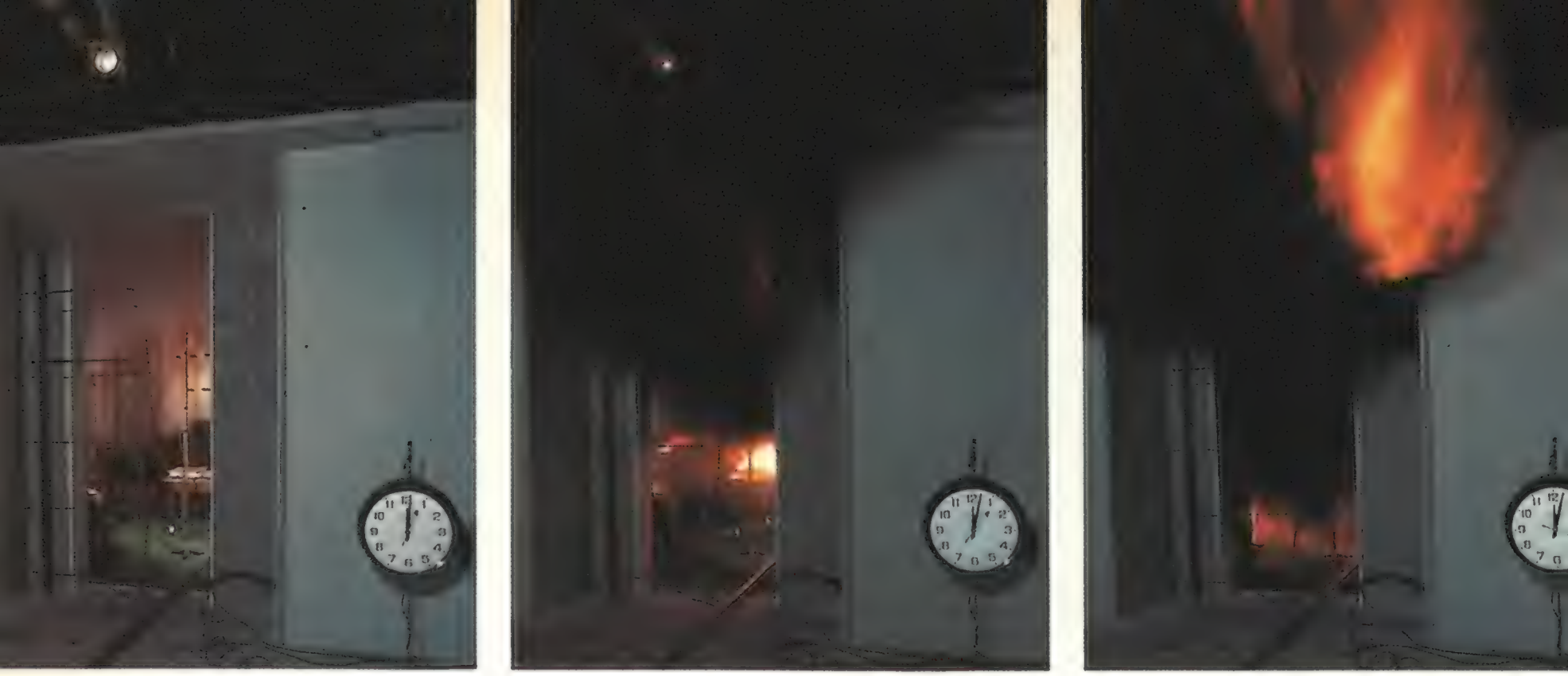
While the bureau was established as primarily a service agency, commissioned to find answers for others who needed them, it has come to take that extra clause as a green light for research into almost any problem that appears to need solutions. In 77 years of keeping up with—preferably staying a little ahead of—an explosively complex world, NBS has proliferated along two dissimilar mainstreams of activity.

In one, the more exotic, it chips away at the remote frontiers of space-age technology. It was no accident that the first big computer in the United States was designed and built at NBS, nor that NBS technicians developed the sophisticated proximity fuse of World War II. By now, the bureau's scientists are far beyond those relatively primitive feats. Some of their work in such esoteric fields as nuclear research, electronic medicine or the search for new forms of energy will be examined in a second article.

In a slightly less dramatic but more immediately utilitarian role, bureau people search for ways to help mankind deal with the nuts-and-bolts complexities of life and work. So doing, NBS has evolved into the strong right arm of industry and one of the best friends the consumer ever had.

NBS is not a regulatory body and carries no authority to impose its findings on either industry or the public. But because its clients include such regulatory agencies as the Environmental Protection Agency, the Department of Energy and the Consumer Product

"Listening room" is used to measure distracting effects of sounds—such as recorded hiss of high-tension wires—on test subjects attempting to read.



In fire lab, a newspaper was ignited on couch of this simulated recreation room. No fire was visible after the first minute (left), but after two minutes smoke began pouring out door (center). Just 14 seconds later the furnishings burst into flame (right). Soon the whole room caught fire (opposite).

Safety Commission, much of what it determines comes eventually to exert the force of law. But sometimes the bureau has the last word on a subject without anybody needing to make a federal case of it. Toward the end of construction on the Trans-Alaska Pipeline System, a dispute arose over the integrity of some 760 welds along the line. At the request of the Department of Transportation, the bureau and DOT's pipeline-safety operations people undertook analysis of the techniques used to inspect the welds, using data furnished by the construction company. To back up its laboratory study, the bureau also sent an engineer to the scene to retrieve weld samples. The study concluded that the company's inspection methods satisfied the regulations in force but that some uncertainty remained concerning the sizes of defects in some welds. Accepting the study, the company repaired the doubtful seams without waiting for a DOT order.

Saving oil, either from spilling out of a pipeline or from reckless human waste, has been a matter of serious concern to the bureau ever since the embargo of 1973 drove home the knowledge that the world doesn't have enough of it. NBS devotes one entire laboratory to developing standards for recycling used crankcase and industrial oils. Studies there indicate that used oil, properly cleaned and reprocessed, is as good as virgin oil. Donald Becker, who runs the program, has calculated that 1.2 billion gallons a year can be saved in the United States if efficient systems for collecting, recycling and redistribution can be developed.

"There are problems," Becker says. "One is persuading the do-it-yourselfer who changes his own oil not to dump the used stuff down the storm sewer. Another is psychological, persuading the driver that recycled oil really is good."

Pursuing a similar goal, a bureau study last year concluded that most home heating systems are overfired and issued handbooks for homeowners and oil-burner servicemen suggesting that up to 20 percent of fuel could be saved by cleaning, adjusting and installing smaller spray nozzles in the heating systems.

Over the decades the state of the nation's health has grown to be a subject of prime interest to bureau scientists. Often, as in the case of dentistry, the bureau's concern has been generated by somebody needing answers and not knowing where else to get them. In 1917 the Surgeon General of the Army turned to the bureau when he found himself peering into the World War I draft army's mouthfuls of bad teeth.

Bureau research turned up some odd and interesting facts about the metal amalgams used for fillings and about dentistry as it was then practiced. Later research showed that some dentists used an amalgam containing amounts of zinc along with other ingredients. They then prepared the material by rubbing or mulling it between their hands. Bureau investigators found that moisture and salts from the dentist's palms were combining with the zinc to produce hydrogen gas which, in turn, caused the filling to disintegrate.

Today, in cooperation with the American Dental Association, the bureau operates a dental clinic and research laboratory. By no means the least of its contributions was the water-driven turbine drill which turned 60,000 revolutions a minute and served as the

The author last wrote for SMITHSONIAN *about Robert Osborn and his airplanes. He is now working on a book about the Pacific Theater during World War II.*

prototype for today's air-driven units, which turn even faster and have taken much of the ouch out of excavating a tooth for filling.

Among the laboratory's current goals is a composite filling material based on resins derived from epoxy-like substances. The aim is a filling material which, reinforced with tiny glass particles to give it body, will both look like natural tooth enamel and be stable enough to stand up under the deleterious effects of permanent immersion in a wet mouth.

"Something like this resin is used in the supersonic Concorde to bond metal parts together," says James Cassel, who conducts the research program. "Ideally it will have to be so powerfully adhesive that it will bond to any surface without mechanical preparation. Some people wear grooves in the teeth along the gum line by brushing too much, too hard. We want a material for shallow defects of that kind as well as for filling prepared cavities."

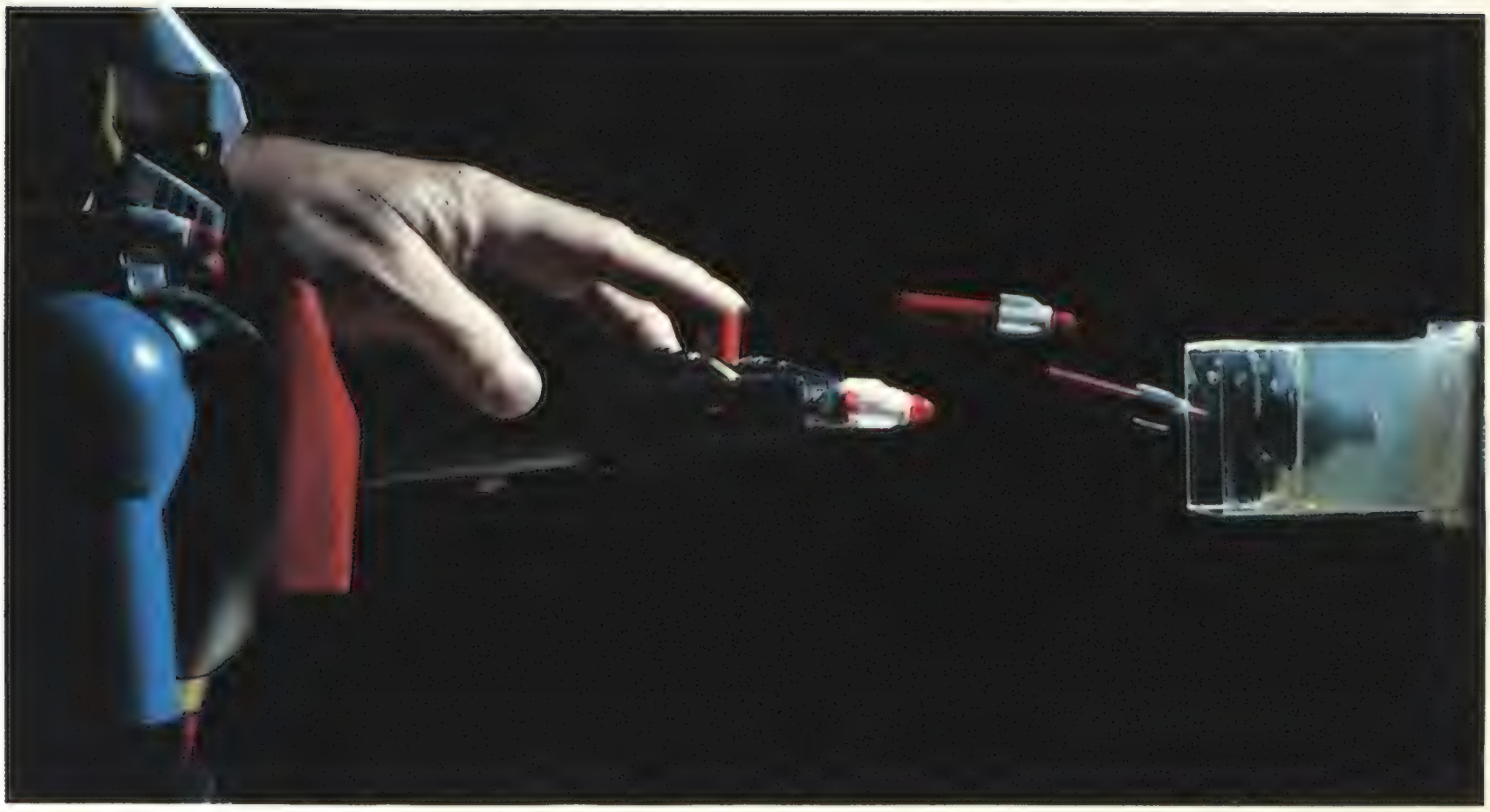
Pursuing means to alleviate another human frailty, NBS turns to its sound technicians. The bureau devotes one entire laboratory complex to the study of sound and ways of measuring it. The twin hearts of the complex are the anechoic chamber, a room whose lining of deep wedges of glass wool on walls, ceiling and floor swallows 99 percent of all sound uttered there; and the reverberation room, a hard-walled chamber designed to preserve sound and keep a whisper echoing for up to 18 seconds, depending on its frequency. At the request of the Veterans Administration, the laboratory has been put to the service of the hard-of-hearing. The VA, acting on a premise that running the machinery of war is a noise-polluted occupation, was being called upon to furnish upwards of 18,000 hearing aids a year to veterans. The lab's sound engineers now employ a life-size mannikin (p. 51) with a microphone embedded in the ear to test some 300 commercial hearing aids for applicability to different kinds and degrees of hearing loss.

Also in service to the hard-of-hearing, another NBS laboratory has developed a decoding device to help the deaf to fuller comprehension of television. Using this system, TV programs would be broadcast with subtitles running across the bottom of the screen. But the printed words would become visible only on sets equipped with the decoder.

Turning its attention to a persistent and environmentally troublesome inner-city health problem, NBS has made a study of the sources of lead poisoning in children. The result upset a notion that youngsters ingested the metal mainly by nibbling flecks of paint in decaying homes. Instead, the study indicated that they were inhaling most of the poison in gasoline fumes spewing from expressways that border on or bore through old inner-city residential sections.

Gauged by some of the investigations on the bureau's active list, America appears to be a dangerous place for the pursuit of happiness. One laboratory specializes in dropping motorcycle and football helmets (p. 48) down a vertical slide to determine how much impact they will stand and how much of it they transmit to the simulated human skull inside. An engineer named Robert Berger has devised a test method to determine scientifically the likelihood of eye injury from a toy projectile such as the miniature warheads (p. 49) fired by fearsome-looking war toys from Japan—are they hard enough, heavy enough and fast enough to damage the human eye? For the Con-

In experiment duplicating reality of the scrimmage line, a football helmet encasing a urethane and silicon-oil "headform" is smashed against hard surface. Test measures impact energy transmitted to skull.



A toy projectile is fired into simulated human eyeball set in gelatin. The purpose of this test is to determine whether the toy is hard enough, heavy enough and fast-moving enough to injure eye.

sumer Product Safety Commission, another laboratory developed a series of tests on bicycle design and construction to try to determine to what degree flaws in the machine contributed to the nation's annual rate of 80,000 bike-accident injuries.

Natural and man-made disasters engage the bureau's attention. Specialists from the bureau visited Hartford, Connecticut, last winter to give technical assistance to local authorities trying to determine why the roof of the city's civic arena collapsed under the weight of snow. Other bureau engineers studied the Alaska flood in 1964, the San Fernando earthquake of 1971 and, at the request of the Agency for International Development, the quake in Romania in 1977 and the June 1978 quake in Japan.

Fire is a contaminant of civilization to which America is peculiarly vulnerable, a fact that appalls NBS engineers and keeps them searching for means to cut down the cost. Every year in the United States fire kills some 8,000 persons, maims another 300,000 and wipes out around $4 billion in property. "America has one of the worst fire records in the world," says Richard Custer, deputy director of the Center for Fire Research in the bureau's National Engineering Laboratory. "We have been exchanging information and ideas with the Japanese, who have one of the best. Our bad record may stem from the fact that we have always been a rich and wasteful people. In this country when a man's house burns down, he gets sympathy —and the insurance money. In Japan, letting your house catch fire—through negligence—is a social offense that puts other people in danger. The victim may be ostracized and even sent to jail."

Cooperating with the National Fire Administration, the fire center does basic research in fire science, safety engineering, the dynamics of fire, its chemistry and its toxicological side effects. Among other matters, the center has tested the flammability of children's clothing and has proposed standards that have been adopted by the Underwriters Laboratory to gauge the efficiency of residential smoke detectors.

In its tests of fire propagation the center sometimes erects and then burns down completely furnished rooms (pp. 46-47). Such tests are expensive, running to $10,000 for a single fire, and not entirely satisfactory since no one fire can be precisely duplicated in a laboratory. Partly to save money and partly to obtain more precise data, the fire specialists are working on a way to reproduce all the conditions of a fire mathematically with a computer, thus sparing themselves some actual smoke, flame and dollars. The center's goal is to help find the tools to cut American fire losses at least by half within a generation.

Lest it appear that the bureau's experiments are exclusively reparative, one should take a look at what goes on in Bowman House off on the fringes of the

A very inquisitive agency

Gaithersburg campus, a 20-year-old ranch house named for the family who once lived in it. It was there when NBS acquired the campus in 1960. It seemed a good idea to get some practical use out of the building and so the house has been converted into a homey kitchen laboratory. At the request of the Department of Energy, bureau engineers worked out a program to study both the efficiency of kitchen ranges and ovens—and those who cook with them. The house was equipped with two complete kitchens and an elaborate monitoring system. To the kitchens, by invitation, 60 housewife volunteers came in relays, each committed to prepare and clean up after a standardized menu of 21 meals—enough for a week's intake for a family of four. NBS furnished the groceries and each volunteer got to take the product of her culinary skill home with her. Half cooked on gas ranges and half on electric stoves.

Each cook had her kitchen to herself but she did not have anything resembling privacy. Researchers observed from behind one-way mirrors and were ready to turn off the power in case the cook did something foolish like sticking a knife into a balky toaster. Remote-control TV cameras kept unblinking eyes on her every move (p. 44), and everything she did or did not do went into a computer for later study. The most startling finding to emerge from the Bowman House kitchens was that some cooks consume 50 percent more energy than others fixing the same meal.

The study moved John Fechter, a bureau research psychologist, to voice a few tips on kitchen technology. "Most cooks in our study," he says, "have a tendency to use the right front burner of the range regardless of the size of the pan. Using too large or too small a pan on a burner can waste energy. Then there's the 'worrier' cook who keeps opening the oven door to see what's been happening."

Nobody can be hardheadedly practical all the time, and NBS, which harbors its share of sentimentalists, doesn't even try. Not so long ago there arose a problem of replacing broken windows in the White House. Now, a broken window anywhere else would be a simple matter of looking in the Yellow Pages and calling the nearest glazier. But White House windows are something very much else. They are full of bubbles, ripples and other quaint imperfections and, what is more, they gradually turn yellow with exposure to sunlight. Confronted with the problem, the National Park Service went where puzzled government agencies usually go, to NBS. And, as usual, the problem was solved. Mario Cellarosi, of the bureau's Inorganic Glass Section, not only found a glass that was flawed enough to look authentically antique but suggested that he could hasten the natural yellowing process by exposing the panes to ultraviolet light at a certain, precise wavelength.

Future administrations will thus have their view of things colored, as it were, by the savants of standards. One might argue that they could do worse.

Reflected in a block of polished steel, a bureau physicist calibrates an ultrasonic sensor. Equipment will use seismic pulses to detect flaws in metal.

The baffles in anechoic chamber absorb interfering sounds and make it possible to test hearing aid attached to artificial ear of the mannikin at center.

Next month: in the vanguard of research

A technique called cross-fostering may help save the whooping crane

To establish a new wild flock, biologists put whooper eggs in nests of sandhill cranes, which hatch the eggs and rear the chicks

The act itself, like many that initiate a dramatic event, is deceptively simple.

Striding through the marsh muck, biologist Roderick Drewien pauses as he passes abreast a crude, slightly raised platform made of dry, brown marsh reeds. He stoops slightly. With one hand he picks up the huge, lovely, brown-spotted egg reposing there, still warm from the body of the mother bird that brooded it until he flushed her from her nest a few moments ago. With his other hand, Drewien now places in the nest another, almost identical egg that he has carried into the marsh. Then, quickly, he leaves.

Within minutes the gray mother bird, her plumage still colored red by the marsh mud that she used for her nuptial self-decoration, will return to the nest. Seemingly unconcerned, she will settle down on the alien egg and incubate it as her own, as will her mate.

She is a greater sandhill crane, a species that is widely, and in a few places still quite thickly, distributed in western North America. This huge 22,000 acre marsh in southeastern Idaho harbors 800 adult sandhills, who even now are being joined by 500 new hatchlings.

The egg Drewien has put in the sandhill nest belongs to North America's only other crane species, the whooping crane. Putting whooper eggs in sandhill nests, a technique called cross-fostering to another

At Patuxent, captive whoopers lift their heads and, in a duet, utter cries for which they are named.

By David R. Zimmerman

Working from an insulated case, Drewien switches eggs of whooping and sandhill cranes at Grays Lake.

species, is a new—and still highly experimental—conservation step being taken to ensure the survival of the whooping crane.

Adult whooping cranes, in sharp contrast to the grayish sandhills, are dramatically marked white birds, with red crowns and black wingtips. They are huge, the tallest birds in North America. They stand four-and-one-half-feet high, have a wingspan of about seven feet, and may weigh 18 pounds.

The whooper probably never was common. Its range extended from the Western Great Plains east to the Atlantic. Many whoopers bred in the marshes of Minnesota, Iowa, Illinois and North Dakota. Others went farther north into Canada to breed, then returned far south to Texas and Louisiana in winter.

The whooping crane population declined precipitously late in the last century. Many wild whoopers were shot. The prairie marshes were drained for cropland, and foxes, coyotes, dogs and other predators gained access to the few remaining nests. Egg collectors also took their toll.

The species was given up for lost on several occasions earlier in this century. But discovery of a winter-

In old Canadian snapshot, man proudly displays dead whooper. Shooting them has been illegal since 1917.

Map compares migration routes of original flock and the new, cross-fostered group. New flight path is 1,650 miles shorter. The eggs come to Grays Lake from both Patuxent and Northwest Territories.

In early spring whoopers at the Aransas refuge, Texas, begin premating ritual with spectacular, leaping

ing band of whoopers in the Aransas Pass area on the Gulf Coast of Texas in 1936 prompted the U.S. Fish and Wildlife Service to set up a 47,000-acre wildlife refuge. Despite this, the Aransas whooper population dropped to 15 in 1941, an event which galvanized a pioneering effort by the National Audubon Society and the federal government to study and save the bird. The whooper's nesting area remained a mystery until 1954, when it was finally discovered in the northern part of Wood Buffalo National Park, which straddles the boundary between the Northwest Territories and Alberta. The Canadians also protected the birds, and the flock began to grow. Nevertheless, many crane experts felt it would be wise to start a backup population —which is what Rod Drewien and refuge manager Ed Loth are doing.

Most of the eggs for this venture come from the Wood Buffalo breeding grounds in Canada. Taking one of the two eggs from each nest has turned out not to diminish the wild population. The adults can rarely rear two young, and the single chick that remains perhaps enjoys added benefit from its parents' undivided attention. Whooper eggs are also brought to the marsh from the Patuxent Wildlife Research Center of the U.S. Fish and Wildlife Service in Laurel, Maryland. This facility recently has succeeded in producing a fair number of fertile eggs from its 11-year-old colony of captive whoopers. The eggs are hand-carried to

dances. Later on the birds will start their 2,500-mile flight to nesting grounds in northern Canada.

Drewien by jet plane, in warmed, insulated, cushioned suitcases by biologists who hold the precious cargo on their laps the whole way, in order to monitor the temperature and further reduce the shock of transit.

The marsh where the foster parent program is unfolding is Grays Lake National Wildlife Refuge, although "lake" is an exaggeration, since it is rarely more than two or three feet in depth. It lies in southeastern Idaho at an elevation of 6,400 feet, and is one of the few high, huge, freshwater marshes in the United States. The flat marsh, and the shores, which rise dishlike in the thin, clear air to high, snow-covered mountains, give a valley-of-the-moon sense to the place.

The area is only lightly populated, mostly by cattle ranchers. Much of the marsh and its shoreline are administered by the U.S. Fish and Wildlife Service as a national wildlife refuge. This refuge status provides some security, but not full protection. The government still leases federal land on and around Grays Lake for grazing. The Bureau of Indian Affairs has first claim on water, the liquid lifeblood of the marsh.

Drought or water drawdown for irrigation can reduce the marsh to puddles, to the detriment of the handful of whoopers, the thousands of sandhills and the tens of thousands of ducks, geese, curlews, grebes, gulls and other waterfowl that breed there. But under normally wet conditions the marsh protects the birds from coyotes and other terrestrial predators.

The idea that sandhills could be used to help whoopers first was put forward in 1956 by Canadian naturalist Fred G. Bard jr. Sandhills could rear the whoopers, then lead them to their wintering ground and back again, establishing the migratory routes that the whoopers would need to form a breeding population.

This plan was attractive because there was concern that the whoopers' wintering ground at Aransas might reach its carrying capacity by century's end. In 1977 the population had grown to 71. While the refuge could contain perhaps 200 whoopers, well over that figure is projected by the year 2,000.

Allowing the entire wild population to remain concentrated at Aransas in winter, and Wood Buffalo in summer, also seemed imprudent. They were—and are—vulnerable to a wide variety of disasters. Epidemic illness is one. At Aransas, a late-season hurricane could decimate the band. So might an oil spill, or a toxic chemical that leaked from one of the many barges that pass through the refuge on the intracoastal waterway.

In the mid-1950s, however, when Bard first proposed cross-fostering, there were no extra eggs or extra cranes with which to start an insurance flock. The breeding ground at Wood Buffalo had been discovered two years before, and it was not yet certain that eggs could be spared for an ancillary conservation venture. When U.S. and Canadian officials decided nearly a decade later that some might be taken, their first choice was to send them to Patuxent, since it was realized—rightly—that a pair of captive birds might be manipulated to produce far more eggs than they ever could in the wild. The venture was put in the hands of biologist Ray C. Erickson, who continues to run it.

But the Patuxent venture progressed slowly, with numerous problems and foul-ups. One hatchling was unable to eat and starved. Another became paralyzed and died. Pneumonia and hatching abnormalities killed several others. A number of captive-born chicks developed crippling orthopedic problems. One chick found and swallowed a nail that perforated its gut. The nail was not discovered until after it died, because Patuxent lacked an x-ray machine. These difficulties were compounded by the fact that cranes are delicate but aggressive birds, and very often are mean to each other and to their human handlers.

The first fertile eggs were produced in 1975. Breeding occurred only after Patuxent, in 1973, added to its staff a skilled animal behaviorist, Cameron Kepler, who was succeeded last year by Scott Derrickson, also a behavioral specialist. They have produced an avicultural breakthrough, so this spring 23 eggs were laid.

The author earlier reported in SMITHSONIAN *on European eagles. His book,* To Save a Bird in Peril, *is about new conservation techniques.*

Foster parents for whooping cranes

When Kepler arrived, the nine oldest whoopers were being kept in an enclosure where they had established a pecking order. By watching them, and listening to their calls, Kepler determined the birds' sexes. He separated them into pairs, based on affection when it was discernible, and his hunch of who might mate with whom when it wasn't.

Each pair was given separated, congenial quarters. Lights were set up to gradually lengthen the daily light period each spring to the 22 hours that wild whoopers experience at Wood Buffalo. This lengthening of the daily photoperiod stimulates breeding.

In these ways, Kepler coaxed breeding behavior out of four pairs of whoopers. They courted, they danced, and some attempted to copulate. But none as yet has succeeded at the latter, so mating always has to be effected by artificial insemination.

The prospect of breeding success made it imperative, in the mid-1970s, that officials decide what to do with the eggs that shortly would be forthcoming from Patuxent, as well as those available from Wood Buffalo.

Meanwhile, Rod Drewien, then a doctoral candidate in wildlife management at the University of Idaho, was positioning himself to be first to put whooper eggs under wild sandhills. As early as 1969, when he first started studying the Grays Lake sandhills, he was aware of Bard's cross-fostering proposal. He also knew that Grays Lake sandhills belong to a subspecies, the members of which are larger than all other sandhills. This would be an advantage for raising the huge whoopers. Drewien moved to Grays Lake to be close to the sandhills, and for several years he immersed himself in the study of their habits and lives. Today, at age 39, Drewien says: "I've spent a quarter of my life so far working on cranes!"

He thus has joined the scientific world's very small band of crane biologists, or grusologists as they like to call themselves, from the Latin name for cranes. Their distinguishing trait seems to be a deep sense of personal enjoyment in observing cranes' behavior. This allure, I believe—after seeing Drewien and other grusologists raptly watching cranes—is not simply the birds' physical appearance, which in most species includes dramatic size and smart, sharply etched plumage. Rather, it is the stately, highly sensual carriage—and particularly their bowing, leaping mating dances—that seem to account for much of their appeal. Cranes dance with a breathtaking grace and beauty. They are human-sized birds; they stand upright as we do. To see them disport evokes strong, hidden sensibilities in well-attuned human observers.

There thus is pleasure as well as work for Drewien as he patrols the marsh perimeter, stopping his truck now and then to peer at a whooper or a family of sand-

An egg, shown 75 percent life-size here, hatches at Patuxent. Plywood whoopers (right), at first

put near chicks to provide sense of species identity, proved unnecessary and are no longer used.

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To establish the captive-breeding program at Patuxent, Canadian biologists sent wild eggs from their northern nesting grounds. After they were hatched the chicks above were reared in indoor pens.

hills through binoculars, or a spotting scope. Drewien is a compact, rough-cut Westerner, whose facial expression alternates between mature matter-of-factness and a more youthful, boyish manner. He is country shrewd, but casual in manner. At work on the marsh, he wears hip waders, faded work clothes, a battered tweed jacket, and a plastic mesh cap that says "Red Baron Flying Service."

As Drewien delved deeper into the Grays Lake sandhills' lives, he found another fact that recommended them as whooper foster parents: their migratory route was shorter than the wild whoopers'—850 miles compared to the 2,500 between Wood Buffalo and Aransas—and seemed unusually secure. They stopped at the Monte Vista National Wildlife Refuge in Colorado, then continued south, where they wintered on or near the Bosque del Apache refuge in New Mexico. They thus were on federal land, more or less protected, much of the time.

Drewien first proposed cross-fostering whoopers to Grays Lake sandhills in 1972. Interest was widespread, but some questions were raised by scientists and naturalists. There were questions, Drewien recalls, "such as how did we know the whoopers would be able to eat the same food as sandhills in the wild, or how did we know they would migrate with sandhills to New Mexico? Some people thought whooping crane migration to Aransas was genetically determined rather than learned, and that Grays Lake whoopers would peel off and try to go over there." Also, Patuxent felt that it needed more time to build up its captive flock, and was loath to surrender any eggs from Wood Buffalo.

Resolution came in 1974. The Canadian government, concerned about the poor showing of Patuxent's captive-breeding effort, was reluctant to send more eggs there (and has not done so to this day). Representatives of the two governments met and agreed to an attempt to establish a new wild flock, using surplus eggs from Wood Buffalo. Plans were made to let Drewien try his hand.

The first eggs were brought to Grays Lake from Canada in May of 1975. Several particularly stable and productive pairs of sandhill cranes—good parents—that Drewien had picked out in advance, successfully hatched and reared their adopted whoopers. Many of the doubts were quickly dispelled.

The sandhills did not abandon the whooper chicks, which for the first six weeks look and sound like baby sandhills. The sandhills' winter diet, largely vegetarian, did nourish the more omnivorous whoopers. The two species' behavioral patterns didn't lead to clashes.

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At Patuxent an ungainly five-week-old chick, grown tired, flops down on its haunches to take a rest.

hatch whooper eggs under sandhill cranes," Drewien says. "It also showed that the foster parents could raise the chicks successfully, take them south, and introduce them to a new wintering area. These birds easily adopt the food and behavioral patterns of the sandhill cranes —they do it quite well."

Only on the wintering ground and, more noticeably, at Grays Lake the following spring, do whoopers and sandhills, as hoped, begin to be aloof and standoffish toward each other.

The decisive question of course is whether the mating urge, when it arrives, will drive the handful of whoopers to find each other on the huge marsh or, rather, will prompt them to court one of the far more numerous sandhills—on which they were imprinted as hatchlings. This year, for the first time, one or two of the oldest whoopers began to dance, and exhibit other of the territorial defense behavior that is a prelude to pairing and copulation. The whoopers now are more hostile than before to their sandhill neighbors, and on some occasions seem to seek each other out for companionship. "At this point," Drewien says, "there is no indication of sexual interest of whoopers toward sandhills, or sandhills toward whoopers."

Whooping cranes do not begin to show signs of reproductive behavior until they are three years old. If they attempt to mate across species lines, this would not doom the project. While crosses can occur between the two species, Drewien easily could find and remove any hybrid eggs that were laid and replace them with whooping crane eggs. When this second generation of Grays Lake whoopers hatched, they would be raised by —and should be imprinted with a sense of species identity from—at least one whooper parent. Their whooper identity might be further strengthened by temporarily removing the sandhill parent.

The venture thus is unfolding according to plan,

Drewien prepares to release young whooper, tagged with identity, age, nest, foster parents.

In migration, whoopers from Texas-Canada flock have legs in landing postion as they glide in to a Saskatchewan field. During the two-week journey the birds stop at sites like this to rest and feed.

except for the loss of young whoopers: the casualties have been unexpectedly high for all three class years from 1975 through 1977, and "disastrous" in the latter two. Sixty-one eggs were put under sandhill parents in the first three years. Of the 35 that hatched, 13 juveniles lived to fly south. But only six are known to have survived through this spring. So the mortality rate, from hatching is already 83 percent in a group of birds that still are two or more years shy of breeding age. (This year, 28 eggs from Canada and Patuxent were put out; 14 hatched. A big mortality between hatching and flying is expected with all wild birds, so before it is time to fly south the whoopers' freshman class may be depleted substantially.)

The first three years, almost a dozen Grays Lake whooper eggs and chicks were lost to late hail, rain and snowstorms. Last year, for example, just after Drewien set out eight eggs from Patuxent, a blizzard struck, dropping 17 inches of wet snow on the marsh. The snow killed two hatchlings: three pairs of sandhill foster parents abandoned their eggs; one pair sat fast. "You could see their necks sticking out of the snow!" Drewien says. But their egg never hatched—and appears to have been infertile.

Ravens eat crane eggs. Coyotes like eggs, and chicks too. Drought conditions in one year, plus what Drewien says was unnecessary lowering of the water level, further opened the marsh to coyotes. "You can't blame a coyote for setting up a den near a marsh—it's a smorgasbord!" says Drewien. "But it's just a little incompatible with the whooper program."

Drewien hopes 1978 will be a better year, because officials killed coyotes on the marsh last winter. He has been assured that the water will not be lowered dangerously again.

Barbed wire and cattle also have proved hazardous. In the first year, cattle were grazed on the marsh, and two chicks disappeared. Drewien suspects they were trampled to death. Barbed wire fencing on the marsh may have prevented their escape. Now, 15½ miles of fencing have been removed, and grazing on land the Fish and Wildlife Service controls is prohibited until the whoopers are on the wing.

More ominous, two older whoopers flew into barbed wire fences near the Monte Vista refuge and died. Drewien still recalls one incident with obvious pain. "I was at the refuge last year when they brought one in. Its neck was broken—it was still warm!" Since the Fish and Wildlife Service can hardly take down all of the barbed wire in the West, this threat to migrating

Enroute from New Mexico to Grays Lake, a lone whooper migrates northward through Colorado with a flock of gray sandhill cranes. Though the bird almost has its adult plumage, it is not yet of breeding age.

whoopers is particularly disquieting. So, too, is the threat on the wintering grounds, where thousands of gunners hunt the snow goose. It is a large, white bird, but is clearly distinguishable from the whooper by any hunter who troubles to look before he shoots.

Some apparently do not bother to. In one season, shots were fired from a car at sandhills—and a whooper —flying over the road. Last year, a hunter shot at and perhaps put a pellet into another of the whoopers. He was arrested, tried, found guilty and sentenced to 30 days. While no whooper is known to have been shot dead in New Mexico, several have disappeared.

In each successive year, Drewien has had more eggs to set out. But because of these and other setbacks he has had fewer survivors each year. In 1977, only one whooper and possibly one other survived out of the 20 eggs which hatched. But this past spring with more water, fewer predators, less barbed wire and no cattle on the marsh near the whoopers, and no snow in sight, Drewien was optimistic. "Conditions look better this year than in any year we've dealt with!"

Even with optimum conditions in the wild, it probably is only by captive breeding that enough eggs can be produced for Drewien to build up a viably large breeding colony at Grays Lake. The eggs will have to come from Patuxent or perhaps another captive breeding program like that started by the International Crane Foundation in Baraboo, Wisconsin.

There usually are about 15 wild breeding pairs at Wood Buffalo Park. Taking one egg from each would yield only 4 or 5 new whoopers a year at Grays Lake, even assuming that Drewien doubles his current early survival rate to 30 percent. On the other hand if, say, 50 fertile eggs from Patuxent could be hatched each year, a 30 percent survival would provide 15 whoopers.

This level of productivity could not have been counted on at Patuxent as recently as three years ago, and the fertility and hatchability rates of its eggs still may be lower than for wild eggs from Canada. Nevertheless, this year behaviorist Derrickson had one female which laid ten eggs, and a second which laid nine —and only four of a possible eight to ten pairs at Patuxent have thus far begun to produce. In short, the resource to make cross-fostering work to provide an insurance bank of whooping cranes exists, or almost does, in the breeding capacity at Patuxent.

"I think if we have enough eggs, it really will work!" Drewien told me. "I'd like to get this going good enough, so that I could go do something else. But I hate to give up on something in the middle!"

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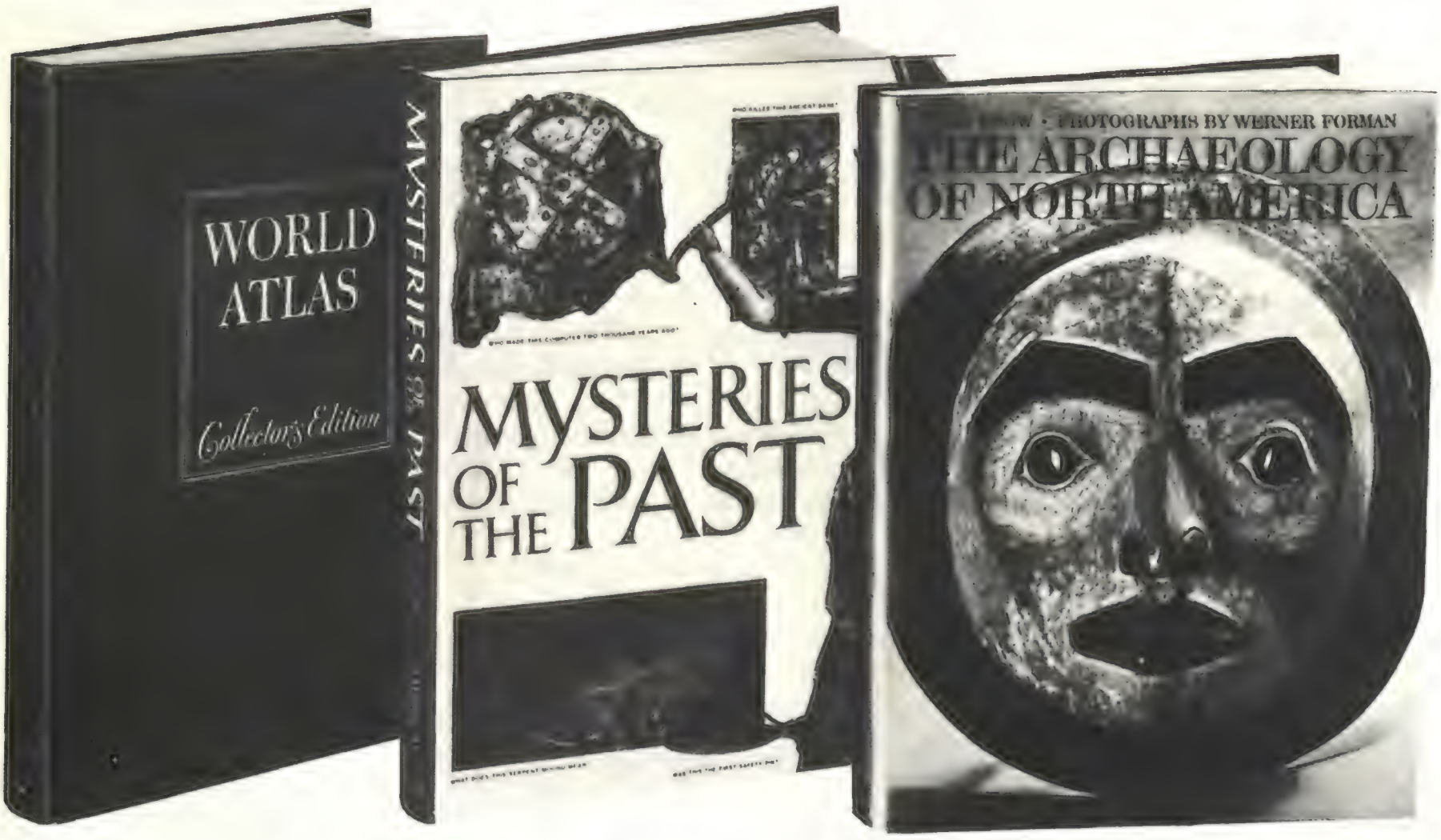

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A dirt biker guns his machine along the wall of Dove Springs Canyon in the California desert. Once covered with thick vegetation, the lower canyon was denuded by off-road vehicles in less than a decade.

By David Sheridan

Dirt motorbikes and dune buggies threaten deserts

Millions of acres of our Western public lands may not survive being used and abused by hordes of off-road vehicles

His knees hugging the gas tank, Jack Turner begins his climb up the canyon wall. The tire treads dig into the ground, throwing dirt behind him. When his back wheel begins to spin, Turner feeds more fuel to the engine with a gentle roll of his wrist. The bike is free and he eases it over the top.

Turner halts for a moment, taking in the view. Below is the broad canyon floor, where he can make out his camper and two small plumes of dust among the scattered creosote bushes: his two boys riding their minibikes. Above are ocher mountains that fill the background. All around is the desert, part of the 25 million acres known as the California desert. Some say motorcycles are killing it.

Turner opens the throttle and his machine jumps forward into the wind. He rides relaxed, weaving between the outstretched arms of the Joshua trees. He aims his front wheel for a bare hillock and throttles up, hitting the slope at almost full acceleration. Briefly man and machine are airborne, then the wheels hit the backside of the rise hard but straight. Never slowing, he heads for the next hillock and again he is flying.

The Turners come to Dove Springs Canyon in the California desert three or four times a winter to "get away from it all." They live in a tract house; Jack works as a quality control inspector in a West Los Angeles aircraft plant; his wife, Vivian, is a part-time bookkeeper. Together they earn about $19,500 a year. Dove Springs Canyon is only three hours from their front door and "it sure beats watching TV or bowling."

Photographs by Howard Wilshire

Crisscross tracks, photographed in the Mojave in 1975, were made by the armored forces in 1940s and 1960s.

Even fences failed to protect these ancient Indian relief images against onslaughts of off-road vehicles.

The Turners are not alone. On nice winter weekends hundreds of thousands of people fan out into the desert to play on their machines. Probably more than three million people (out of a total population of 11 million in the Los Angeles-San Diego megalopolis) enjoy off-road vehicles (ORVs). Motorcyclists like Jack Turner are in the majority, but dune buggies and four-wheel-drive vehicles are popular, too.

No doubt about it, careening across open desert on 300 pounds of roaring metal is, as Turner says, "damned exhilarating." But the land he is tearing up is everybody's, public land entrusted to the Bureau of Land Management (BLM). And the Bureau finds itself in an angry debate over the fate of the desert.

Turner does not deny that he and his fellow ORV riders are damaging the land. It is plain to see. Turner himself can remember when the lower part of Dove Springs Canyon was not stripped almost bare of vegetation, when its walls were not gullied and pocked with bedrock outcroppings. In the last eight or nine years, about 1,500 of the canyon's 5,000 acres have been severely damaged by ORV use.

"So what?" asks a genuinely perplexed Jack Turner. "This is desert, after all. Look around, it's not good for anything else; it's a wasteland."

Whether the California desert is a useless wasteland is the core of the controversy. And the resolution of that controversy will settle the future of an immense chunk of southern California, stretching north beyond Death Valley to Eureka Valley and south to the Mexican border, a distance of about 255 miles. On the east it is bordered by the Nevada state line and the Colorado River and on the west by the Sierra Nevada and the coastal mountain range. The desert begins just 25 miles north or 84 miles east of downtown Los Angeles, and just 54 miles east of downtown San Diego. Of its 25 million acres, some 12 million are managed by the BLM, and it is the BLM that is caught in the cross fire of competing interests.

Scientists who oppose the continued encroachment of ORVs into the desert say it is good for many things, some of them to be found nowhere else. The desert expanse is really a series of habitats, they say: springs, stream remnants, oases, playas and sand deposits. These isolated ecological systems have been likened to a series of archipelagoes, each possessing its own distinctive biota.

In fact, the desert and its adjoining arid lands "rival the Galápagos Islands in their potential for shedding light on evolutionary processes," according to Robert Stebbins, a zoology professor at the University of California, Berkeley, and author of the *Field Guide to Western Reptiles and Amphibians.*

To walk a desert canyon with Stebbins is to see a land radically different from the ORVer's realm of mechanized adventure. It is to see the tracks of the kit fox and the ground nest of the horned lark. It is to see an agile side-blotched lizard dart beneath a Joshua log or a red-tailed hawk glide silently overhead. This dry land comes alive. All manner of creatures manage to survive in the desert—from larger mammals such as bighorn sheep and badgers to reptiles such as the endangered desert tortoise. There are even amphibians here such as the spadefoot toad, which buries itself in the loose desert soil for long periods of time; when rain finally falls, the toad emerges and heads for the nearest pond. There the spadefoot toad croaks and copulates furiously before the sun can soak up the shallow water, making the most of this rare chance.

Places such as the Imperial Sand Hills or Dove Springs Canyon evoke Lewis Mumford's warning about losing the Earth's biologic diversity: ". . . We shall find ourselves enclosed in a technological prison, without even the hope that sustains a prisoner in jail —that someday we may get out. Should organic variety disappear, there will be no 'out.' "

We may need desert plants

The scientists contend that the desert biome's value is more than theoretical or esthetic. The desert is a storehouse of genetic information that humankind can ill afford to lose. "Perhaps some desert grasses harbor genes potentially useful in breeding disease resistance or the ability to grow in salty soils into our cereal grains," says Stebbins.

Recent studies show plant life in "moderately" used ORV areas has declined about 50 percent, terrestrial animal life about 60 percent. In the so-called pit areas (pp. 70-71), where ORVers congregate and park their campers, cars and pickup trucks, plant life is down 90 percent, animal life 75 percent.

ORVs devastate desert life so effectively because they attack that thin layer to which all life clings: the soil. Tires churn topsoil into a loose aggregate which, with the first hard rain, turns into a slurry and flows downhill like lava. The steeper the slope, the more serious the erosion. Ruts become gullies and, if there are enough of them, the hillsides are deeply carved.

Flat areas are also highly vulnerable. A thin layer of tiny pebbles called "desert pavement" covers many of these areas, protecting the soft, fine-grained materials underneath from wind erosion. But the pavement cannot withstand more than a few passes by an ORV.

Dr. Howard Wilshire of the U.S. Geological Survey has found that ORVs can cause staggering soil erosion.

David Sheridan has just written a book on off-road vehicles for Council on Environmental Quality. He wrote about coal in August 1977 SMITHSONIAN.

The Panoche Hills in the Diablo Range, a semiarid area southeast of San Francisco, were open to ORVs for three years and then closed. Four years later, the land used by ORVs was losing soil at an annual rate of nearly seven tons per acre, while erosion from undisturbed land in the same area was too small to measure.

Farther south, Los Angeles County sank three bench marks into the crest of a hill on the western edge of the desert in 1969. The markers were embedded in concrete to depths of one to two feet. By 1977 they were gone. The ground around them was so eaten away by motorcycles and cycle-stimulated erosion that there was nothing left to hold them, and the markers, concrete and all, rolled down the hill.

Of course, the eroded soil goes somewhere. Some of it ends up piled at the bottom of slopes, burying vegetation and burrowing animals. Some washes into stream beds, choking plant roots and muddying the water. And some is carried away by the wind, occasionally as dust storms. Airborne dust aggravates various respiratory diseases such as emphysema.

Continuing their argument, scientists point out that it is not only the plants and animals that live in the desert today that are endangered by ORVs. Remains of earlier inhabitants—plants, animals, ancient human beings and their works of art—are also being destroyed.

In prehistoric times, the California desert was a lush savanna with broad lakes, and today it contains a

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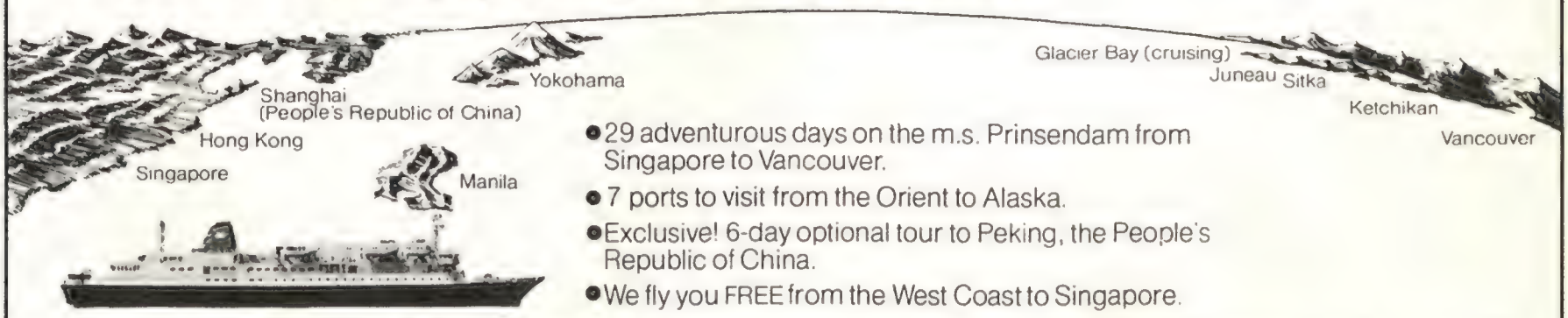

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Off-road vehicles strip-mine desert

wealth of fossils. Important discoveries have been made here. Now paleontologists report that ORVs are obliterating some of the desert's major fossil beds.

The same is true of archaeological resources. Artifacts of human occupancy can be traced back thousands of years. The desert contains the largest concentration of prehistoric art anywhere in the world, including petroglyphs (carvings on rock), pottery and rare intaglios. These last are decorative Indian designs, akin to cave paintings, probably created several hundred years ago by scraping aside a layer of dark pebbles at the surface and exposing lighter material underneath. Some are geometric designs or mazes up to two miles in diameter; others are human and animal figures, one of which is 489 feet long.

Almost all the desert's known intaglio sites have already been cut by ORV tracks (p. 68). Vandalism of other archaeological sites has accelerated because of the increased access provided by ORVs. Petroglyphs are simply being carried off as souvenirs.

A final complaint comes from other users of the desert, not just scientists. They argue that ORVs seriously impair other people's enjoyment of the desert. Many people go into the desert seeking quiet and solitude. As a BLM environmental impact statement noted: "Silence is a resource. These sounds which Man typically associates with pristine natural environments are perceived by the senses as solitude. The solitude of the desert is one of its dominant characteristics as well as one of its many valuable resources."

The noise of the average ORV disturbs the desert solitude. ORV noise carries a long way, especially during the quieter times of the day—early morning and dusk. Jack Turner's motorcycle can be heard one to two miles away, the average dune buggy two to three miles away.

BLM recreation planner Robert Badaracco reports

Dirt-bike racers head up hill in the Shadow Mountains north of Victorville. Area retains some vegetation.

The problem is not confined to California. These tracks were made at East Capitol Reef in Utah.

that generally the more aggressive, consumptive, uncontemplative recreational activities, such as ORV riding, preempt and drive out those that are more passive and contemplative. A decade ago people came to Dove Springs to camp, to hike, to collect fossils and to observe the birds. Today, the canyon is totally dominated by ORV users. On a Memorial Day weekend, there may be as many as 500 machines in the once-tranquil canyon.

A poll of Californians revealed that 45 percent of them visited the state's deserts in the last year. The most popular recreational activities were sightseeing and picnicking, followed by camping, fishing, photography, hiking. Of those visiting the desert, about 15 percent expressed interest in motorcycle "riding or play," and fewer voiced interest in four-wheel-drive vehicle and dune-buggy driving.

Intrinsic conflict in the law

When BLM ranger Steve Smith examines the environmental damage wrought by ORVs in places such as Jawbone Canyon, he is appalled. Scientists want to close areas such as this to ORVs. "They'll just go somewhere else, and the problem will start all over again," Smith replies. His agency is supposed to be the steward of this land. Under federal law, the BLM is required "to conserve these resources for future generations," and at the same time "to provide present and future use and enjoyment, particularly outdoor recreation uses, including the use, where appropriate, of off-road recreational vehicles."

Has the BLM fulfilled its responsibility to the public? The ORVers are split. Some hold that the BLM is "the most enlightened government agency from the point of view of the ORV enthusiast." Others charge that the BLM has "sold out to the preservationists." ORV opponents, especially in the scientific community, think the BLM has been "overly generous with the public's land in providing for ORV recreation."

President Carter signed an Executive Order on May 24, 1977, which requires public land management agencies to close areas or trails to ORV use "whenever" it is determined that "the use of off-road vehicles will cause or is causing considerable adverse effects on the soils, vegetation, wildlife, wildlife habitat or cultural or historic resources."

Under the BLM's current plan for the California desert, four percent of the land is "closed" to ORVs; eight percent is open to cross-country ORV use; the remainder is "restricted," which means the ORVers are supposed to keep to existing roads and trails. The major flaw in this scheme is the BLM's lack of presence in the field. A person can drive all day on a motorcycle and never see a BLM sign or enforcement officer. In-

Off-road vehicles strip-mine desert

deed, the BLM has only slightly more than a dozen rangers to patrol this vast area.

According to a BLM estimate, about 15 percent of the public land it manages (about 1.8 million acres) is completely open de facto. In addition, less than 100 miles of the desert's 30,000 miles of mostly dirt roads have been closed to ORVs. And ORV drivers riding these open roads leave them to travel cross-country with impunity, regardless of whether the BLM has designated the land "restricted" or "closed."

Stebbins and others believe the only way to control ORVs is to declare the desert closed to them except for special "sacrifice areas," which would be maintained exclusively for their use.

How does the American public want the desert managed? In a recent Gallup poll, some 81 percent responded that they wanted more protection of wildlife; only 23 percent wanted more places provided for off-road vehicles.

The ORV users, of course, feel they have a stake in the desert, too. They are a large minority, they have a major investment in their machines, and they have in fact been allowed to use the desert all these years. Racing across the desert, climbing hills and jumping obstacles is exhilarating, comparable perhaps to downhill skiing or white-water rafting. And it is easier to measure the acres damaged by ORVs than the social benefits, the outlet for human spirit, they provide.

The California desert is part of one of the largest relatively unbroken stretches of wild land left in the United States outside Alaska. Now it is threatened and could become the genuine wasteland we once thought deserts to be. The smoke tree and the desert tortoise, the ironwood and Gambel's quail, the intaglios and the petroglyphs are disappearing. It is not yet too late, but the desert is a fragile place and cannot survive forever strip-mining by our adult playthings.

Tracks of cyclists scar Bench-Mark Ridge in San Emigdio Mountains. Some ORVers have been killed in spills here

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By Sherwood Davidson Kohn

It's OK to touch at the new-style hands-on exhibits

From Brooklyn to San Francisco, and in between, participatory museums bring visitors in touch with learning

Air blast which holds ball up and demonstrates low pressure over curved surface, here causes squeals.

In the architecturally elegant Crown Heights section of Brooklyn, at the corner of Brooklyn and St. Mark's Avenues, stands a perfectly preserved 1907 New York trolley kiosk, its copper-roofed, pagodalike box transplanted from the west end of Manhattan's Queensborough Bridge, about six miles away. It is nowhere near the nearest subway stop.

At the other side of the country, within sight of the Golden Gate Bridge, rises a delicious wedding cake of a building, its extravagant arcades reflected in a shimmering lagoon, its pink Corinthian columns surrounding a pantheonic dome. This charming Beaux-Arts confection, designed by the flamboyant architect Bernard Ralph Maybeck, is all that remains of San Francisco's 1915 Panama-Pacific International Exhibition. It is called the Palace of Fine Arts, but it has not housed an art collection, in the conventional sense, for more than 60 years.

Neither of these relics is intended to evoke a feeling of nostalgia. The kiosk serves as the entrance to the Brooklyn Children's Museum; the Palace's exhibition hall houses San Francisco's Exploratorium. Both buildings are signposts to adventure, structures rescued from the past and set to work as fanciful gateways to knowledge about the real world. They lead to museums of a special variety, rapidly gaining popularity as "participatory" or "hands-on" museums. These museums, found in Brooklyn, San Francisco and perhaps a dozen other cities around the nation, are frequently dedicated to children.

While most hands-on museums operate according to the basic principle of learning through doing, each—influenced by the philosophy, style and creativity of its director—approaches the educative process along somewhat differing lines. San Francisco's nine-year-old Exploratorium has a million-dollar-plus budget and coordinates its programs with the educational system.

Photographs by Christopher Springmann and Jonathan Atkin

Beam of sunlight is separated into its component colors by prisms at the San Francisco Exploratorium.

When three youngsters enter the Exploratorium's walk-in kaleidoscope, they turn into a crowd.

The Exploratorium tends to reflect the broad artistic and scientific interests of its founder, physicist Frank Oppenheimer, brother of the late nuclear physicist, J. Robert Oppenheimer.

Like San Francisco itself and the Palace of Fine Arts, the Exploratorium is at once serendipitous, romantic and full of the excitement of discovery. "I intended a kind of woods of natural phenomena that were organized and selected in some way so that people could take many constructive paths," said Oppenheimer. "This is not a museum, it's a curriculum."

It is, in fact, a large, highly sophisticated school of science, in which the surface offers the appearance of random activity, but is actually undergirded with a dense web of interrelated stimuli.

Preconceived notions destroyed

At least one of the exhibits seems to characterize Oppenheimer and his methods. A random-dot stereogram, devised by Bella Julesz of Bell Labs, seems at first glance to be nothing more than a vague arrangement of dots. But the dots stimulate the viewer's brain into arranging them. The result, after one stares at the dots for a minute, is a three-dimensional pattern, created entirely in the mind.

"A place like this undoes a lot of preconceived notions about science," said Oppenheimer. "Visitors react so strongly to these phenomena that they try to find explanations for themselves and the people they're with, even managing to ignore the so-called collective right answers of science." What is more, the exhibits are tremendously entertaining to adults and scientists as well as children. Some are designed and produced by artists and all are made on location in machine, electronic and graphic shops equipped with everything from precision machine tools to fine scroll saws.

Sometimes an exhibit seems to have been included without any specific purpose in mind, except that it was interesting and touched with a glint of humor. Suddenly, though, like the random-dot stereogram, it may form itself into a pattern of profound insight. A "tactile tree," for instance, offers the visitor a gamut of touch sensations: rough bark, brush foliage, a fur-lined hole and a branch that sneezes water on you if you venture too close. In another area, a drum, surrounded by padded sticks and activated by a mysterious mechanism, plays furiously on the hour. Elsewhere, an "enchanted tree" that links a computer, an amplifier and myriad colored lights, turns sound impulses into a branching display of pulsing hues.

Oppenheimer's scientific forest also contains some very clearly focused wonders. Two picket fences with slightly different spacing have been fastened together to illustrate the beat principle of sound. A delayed-speech device shows visitors the importance of our own sound perception. A vacuum-cleaner hose bent into a U-shape and fitted with an earpiece at each end illustrates how we locate sound sources. A ball balanced in a vertical airstream demonstrates the Bernoulli effect that causes lift on an airplane's wing (p. 78). A tank of feather worms and a bed of mimosa plants contrast the sensitivity of flora and fauna to the human touch.

In the Exploratorium, which offers more than 400 hands-on exhibits, you can shake hands with yourself via a mirror mounted in a box, perceive two attached rings as floating in the air, watch a beam of sunlight paint abstract pictures on a screen (p. 79), see a hissing, chuffing steam engine's piston oscillating in its cylinder, observe an elephant fish's navigational impulses registered on an oscilloscope.

Across the country, the Brooklyn Children's Museum (BCM), headed by Trinidad-born and Brooklyn-educated Lloyd Hezekiah, has a more carefully ordered look about it, despite the fact that its architects and planners obviously intended visitors to enjoy almost total physical freedom. As I moved through its airy spaces, my eye pleased by its warm wood floors, massive laminated beams and bright splashes of color, I sensed that I was being carefully and subtly directed among the exhibits—first to a level dealing with the forces of fire and light, then to one explaining water, then air and finally earth. Along the way, I was exposed to natural history, technology and cultural history. I had the distinct impression that the building and its contents constitute a total teaching environ-

Adults join the fun in the Shadow Box where phosphorescence retains shadows caused by strobes.

At Brooklyn Children's Museum, young visitors turn the crank that activates a water wheel.

ment in which even the plumbing and the air conditioning are part of the learning experience.

Later, Director Hezekiah confirmed my impression. "What we have in this museum," he said, "is basically a series of educational tools. Everything is used as a catalyst for the learning experience." Which seems entirely appropriate in view of the BCM's beginnings in 1899 as the first children's museum in the world. "It was originally conceived as a participatory museum," said Hezekiah. "The original intent was to create an extraordinary learning place for children, where children could feel that something had been created especially for them. We have always felt that a child's world was a very special one, and that children are not young adults, but important in their own right."

At first, the Brooklyn Children's Museum was housed in two old mansions in Brower Park. When the Victorian houses were razed in 1969, the museum moved into temporary quarters not far away, where many of its innovative community and school-interaction programs were developed. Nine years later it opened its doors on the original site in Brower Park, but in radically different form.

The new $3.5 million BCM building, designed by the New York architectural firm of Hardy Holzman Pfeiffer Associates, is unique. Instead of being built on the land, it is built under it, at least 40 feet down, like a giant basement with a two-story window well pouring light through its south wall.

The old subway kiosk on the north side lends exactly the right touch. As you enter, you walk down, through a 180-foot "people tube" (actually corrugated steel sewer culverts) spiraled with a neon helix showing the colors and wave frequencies of the spectrum.

Sherwood Kohn, a Washington writer, was formerly on the editorial staff of National Geographic.

Through the center of the tube runs a stream of water, controlled by a trough that serves as the medium for a series of hydraulic exhibits, complete with locks, weirs, a turbine, water wheel and various other devices that visitors are encouraged to operate.

Slicing diagonally down through the concrete box that is the museum's basic shape, the people tube is broken into four sections as it descends to the lowest level of the building. Each opens onto a kind of giant stairstep, and each level corresponds to a particular sphere of interest. The top step includes exhibits of primitive cultures where children can bang on a real jungle telegraph, shake rattles (p. 83) or play a flute that is powered by a stream of air. The main exhibit on this level is concerned with fire and light. A sprightly red-and-yellow steam engine named "Gabrielle," after Gabrielle Pohle, the BCM's assistant director, attracts visitors to its crankings and spinnings with blasts of its friendly whistle (p. 83). Other exhibits include a ripple tank casting wave patterns on a floor-mounted screen; and a grist mill which grinds grain that may have come from the museum's greenhouse.

On the next level down, an air-driven calliope, made in the 1920s by the Tangley Company of Muscatine, Iowa, and called a Calliophone to distinguish it from the steam-driven variety, invites children to duplicate the sound of an old-time circus (while they learn about resonating air columns); a farm windmill from Beatrice, Nebraska, turned briskly by a breeze from a large fan, pumps water into a trough (it can be detached to allow children to work the bright red pump by hand); and an air pressure lift, which looks like a giant ac-

An antique steam engine, refurbished to run, illustrates conversion of water into steam.

Children study musical instruments from Brooklyn museum's collection. They also try to make their own.

cordion bellows topped by a platform, gives children rides between levels three and four.

Arching over the conduits, two giant clear plastic models of a protein molecule and a diamond crystal, magnified eight billion times, look like foam bubble bridges mounting into the free space of the museum, beckoning children to climb around inside their labyrinthine surfaces (p. 84).

And at the lowest level, against the west wall, a gas storage tank has been converted into a semicircular auditorium that seats 100 for film and slide shows.

Outside on top of the building, the architects have mounted various artifacts from contemporary life: an expressway sign that announces the museum's name, I-beam sections that serve as seats, a grain silo that houses the building's fire escape, a whale-shaped series of concrete free forms for climbing, bleacher seats for an open-air theater—all surrounded by greenery.

Inside, at the bottom of the building, in the spaces underlying its main levels, the architects have stowed exhibit workshops, darkrooms, resource centers, laboratories, dance studios, arts and crafts workshops, and exhibit storage. The museum has 40,000 objects in its collection, which are used as teaching tools. It is also preparing "teaching kits" for use by public schools.

Education is, in fact, BCM's main reason for being. It is, by tradition and present arrangement, a learning resource center for the New York City public schools, and is open to the public only between 1 P.M. and 5 P.M. daily, except Tuesday. The rest of its time is reserved for class visits and workshops.

Increasingly, the concept of the participatory museum is gaining acceptance. In Fort Worth the local Museum of Science and History is regarded as a "teaching environment" that constitutes the largest museum school in the country. The Corpus Christi Museum works diligently to "create a thirst for knowledge." In Little Rock, Arkansas, the Museum of Science and Natural History, housed in the city's old arsenal building and rapidly expanding, concentrates on an environmental education program utilizing exhibits as the core of a community outreach service.

The Jacksonville Children's Museum designs its exhibits as "total environments" that surround visitors with sensual learning experiences. The Oregon Museum of Science and Industry in Portland operates like an educational institution with emphasis on field trips. Seattle's Pacific Science Center offers aerospace, technology, life sciences and mathematics exhibits in the U.S. Science Pavilion left standing after the Seattle World's Fair of 1962. Indianapolis recently completed the largest children's museum in the world, containing an 1868 locomotive, a 360-seat theater, a television studio, a library and eight exhibit galleries. The Boston Children's Museum, one of the oldest in the country, is expanding into a new center, and the Rensselaer County Junior Museum, which moved into a renovated firehouse in Troy, New York, five years ago, has become a force in community renewal.

Children's museums are opening up and reaching out to the general public, to adults as well as children, not because they are fun, which they are, but because they have pioneered an approach to learning in an age when knowledge is becoming a matter of survival.

Children's jungle gym
in the plastic model
of a protein molecule

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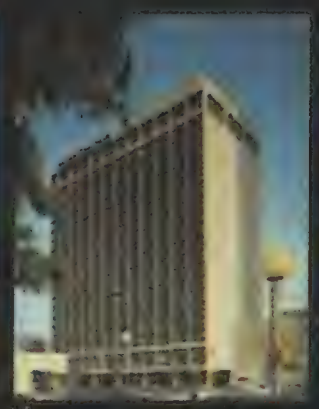

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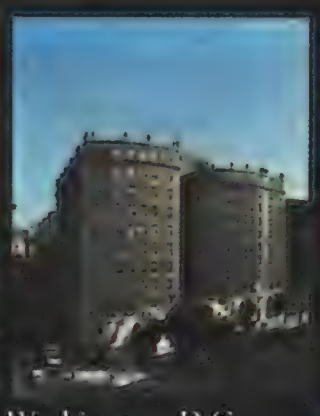

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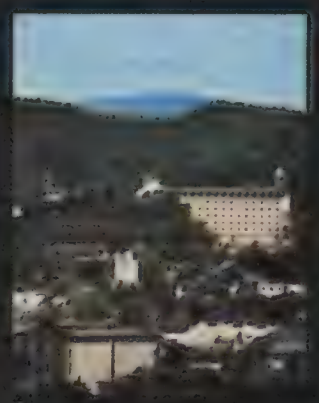

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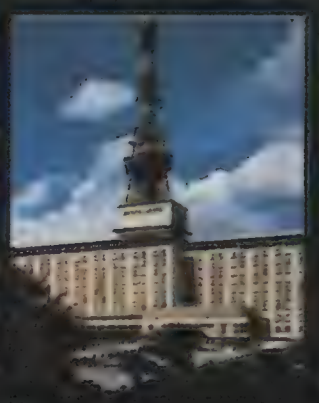

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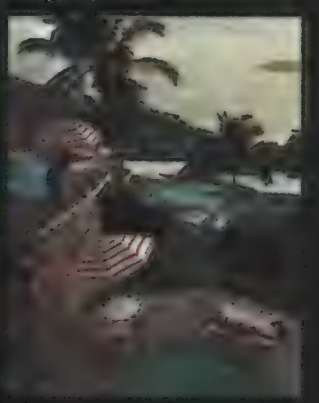

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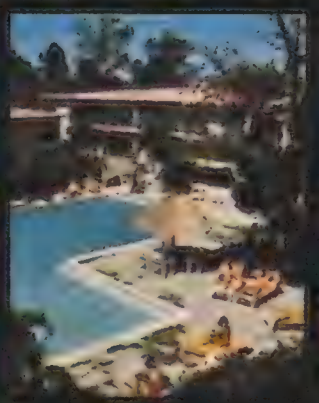

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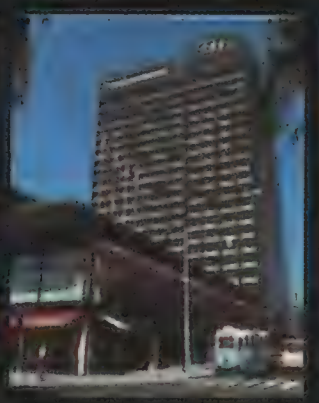

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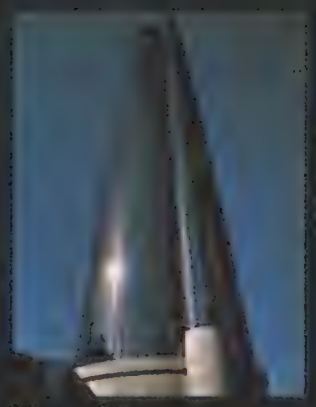

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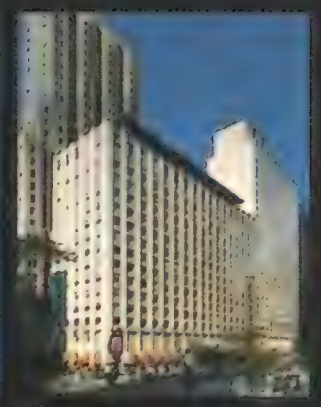

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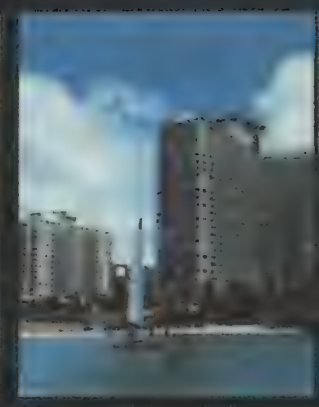

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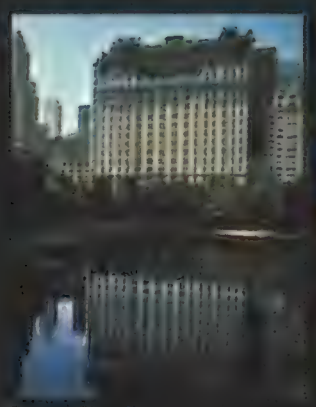

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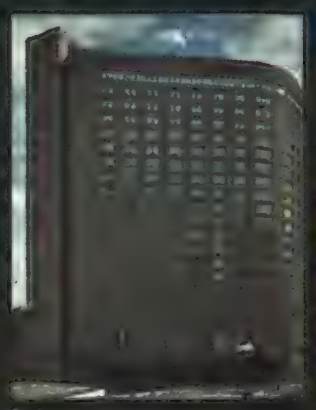

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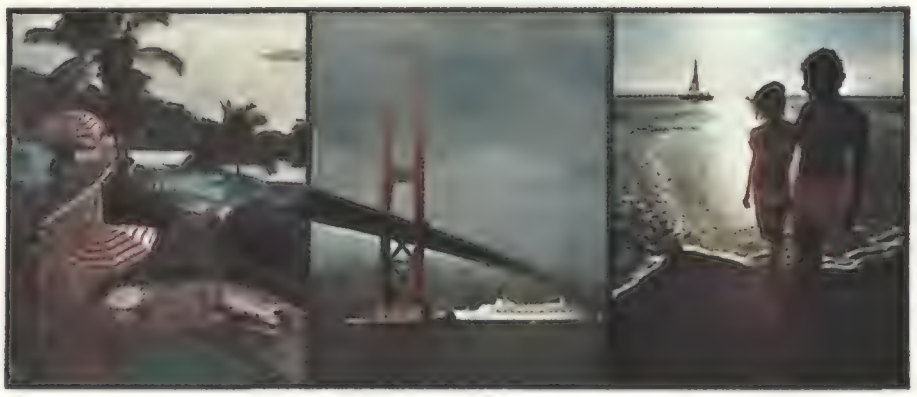

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By Adrienne Farrell

A half century of lasting imprint

Guru of gravure, Hayter began his Atelier 17 as printmakers' workshop, not a school. He provokes, irritates, cajoles and inspires

Stanley William Hayter is known to artists and others in the world of creative achievement as one of the most remarkable men of this era. He is considered by many to be the most influential engraver alive, a peerless catalyst and innovator who has helped 20th-century printmaking reach remarkable heights. Hayter is also a painter of high quality, a rare personality and wit, and a steadfast colleague and friend to many notable figures of our time.

For serious students of art, Hayter is virtually a legend. But, as sometimes happens to major figures, he is not widely known to the public in general.

Hayter's Atelier 17 in Paris, a workshop devoted to experimentation in the techniques of printmaking and a historic monument to anyone working in this field, is winding up its 50th anniversary year. The occasion finds it burgeoning with vitality, jammed with artists still devoted to making new discoveries and, in the long-time Hayter style, seeking to stimulate a sense of creative adventure.

The list of artists who have worked at Atelier 17 in Paris—or in its sister studio in New York during the Forties—constitutes a "who's who" in world art of the last half-century. Besides Picasso, Pollock and Chagall, it includes Kandinsky, Max Ernst, Miró, Arp, Tanguy, Giacometti, Matta, Brauner, Alechinsky, Ubac, Jacques Lipchitz, Calder, de Kooning, Isabel Bishop, Rothko, Vieira da Silva, Motherwell and others.

Hayter got to know just about everyone passing

Hayter, full of life and art at 76, pauses before latest canvas, which he calls "Work in Progress '78."

Shige Ohashi, Tokyo, examines proofs which are spread out at Paris atelier.

through Atelier 17, and he has kept in touch with many of them. His *"anciens"* who once worked at the atelier always get a warm welcome when they return. Many of his former students are teaching in various parts of the world, helping to propagate the atelier's discoveries, which have become basic knowledge for anybody working in the field of gravure.

Gravure, what British art critic Herbert Read lamented as "the Cinderella of the arts," generally refers to all forms of art which get their effect from the incision of a groove into some resistant material—dry point, mezzotint, burin engraving and etching. Before the founding of Hayter's Atelier 17, this technique had "never realized half its potentialities," wrote Read in a preface to Hayter's classic *New Ways of Gravure*. "Hayter and his pupils have discovered new processes and new possibilities in existing processes," he wrote. "They have added new 'values' to the art—values of texture, of dimension, one might even say of color." Read also credits Hayter with reviving "the workshop conception of the artist—the artist, not as a lone wolf howling on the fringes of an indifferent society, but as a member of a group of artists working together, pooling their ideas, communicating to one another their discoveries and achievements."

Born in London in 1901, Hayter was from his youth attracted to both science and art. He graduated with an honors degree in chemistry and geology from King's College, London. This scientific interest, while somewhat submerged in later years in favor of engraving and painting, certainly had a bearing on his later career; he never lost his fascination with experimentation and technical innovation. After graduation, from 1922 to 1925, he worked for the Anglo-Iranian Oil Company in the Persian Gulf, drawing and painting in his spare time. A show in London on his return started him on a career in the arts, which he decided to pursue in Paris.

The Paris of the Twenties was made for the young Englishman. The year he arrived—1926—was full of excitement and turbulence. Dada had faded and surrealism was now the talk of the avant-garde. The young Hayter, with his English charm, handsome, chiseled features and ebullient personality, quickly made friends among the international group of artists and writers. Even the French found him fascinating (no mean trick then or now) and delighted in his exuberant way of telling jokes, his frank laughter and his Anglicized French punctuated frequently with *"mon vieux."*

Not long after his arrival, Hayter set up the workshop which eventually would be known as Atelier 17; it was in October 1927. He explains why: "I had in mind that something should be done about the graphic business. After all, in painting and construction, the world had been changing very rapidly. . . ." But "I knew it wasn't going to be done by one person working alone in a corner, that it had to be experimental."

Hayter immediately decided that his workshop would not become another art school. His method is

Adrienne Farrell, an artist and writer, was a student of Hayter's in Paris and recently revisited him.

Mexican Alfonso Monreal engraves at new Left Bank headquarters.

Akemi Noguchi of Osaka works on print. Some 40 artists currently use studio.

Juan Valladares of Peru is a five-year atelier veteran.

to provoke, cajole, irritate, ask impossible questions and generally "stir things up a bit" to get his victim to thinking and looking at fresh possibilities. Making art has got to be "exciting" and an "adventure," he says. "Trying to teach art is obviously futile: why, I've probably learned more from my students than they ever did from me."

In 1934, after seven years together, the workshop group, which included Miró and Tanguy, had its first exhibition in Paris. "Nobody knew who was running the shop," Hayter recalls gleefully. Someone in the group suggested Atelier 17 as a title for the show because the studio was then located at 17, rue Campagne-Première. And the name stuck, if the location didn't.

Hayter met Picasso in 1934 and they worked together for several years. Hayter made some engraving tools for Picasso, and the way he used them, Hayter recalls, "was the way nobody else would. . . . The point about Picasso was that he would take anything whatever and do something with it that nobody else could do." Or: "With people like Miró, Chagall and so forth, you didn't have the problem that you have with beginners, with their vanities. . . . They weren't embarrassed to ask questions."

Hayter has long and close ties with the United States, where he lived for a considerable stretch in the Forties. Although he did some teaching in other cities, including San Francisco, Philadelphia and Chicago, his principal center of operations was New York, where he established a workshop in the New School for Social Research. "Those days in New York," Hayter says, "nobody knew anybody else. They were working in a remote corner; they didn't get together." Atelier 17, which the New York workshop was also named, became an artists' meeting place, a continuation of Hayter's enthusiasm for the "getting together operation."

Recently I visited the new Paris headquarters of Atelier 17. Like the others, it is located in a lively *quartier populaire* on the Left Bank, but this time it's in a new, rather ugly modern building. Inside, the space is bright, swept clean, with the usual long work tables, press, felts, pans and tools, all carefully arranged in the Hayter style. Around 11 o'clock—it's one of his days—Bill arrives, looking gay and debonair, wearing a checked shirt and sweater, his hair flying. He kisses a girl or two, in the French style, pulls someone's pony tail, asks several *"Ça va?"* while glancing at their plates. Later, I overhear him speaking a bit sharply. One "shows the procedure once, one explains it a second time, and *après cela, ça commence à devenir ennuyeux* [after that it gets to be a bit of a bore]."

Hayter had only just returned from Rome, where he'd gone for the opening of an exhibition of his work. Over the years, he has won all kinds of honors and has had retrospectives in, among other places, the Victoria and Albert Museum in London, the Musée des Arts Décoratifs in Paris and the Smithsonian's National Collection of Fine Arts in Washington.

Commenting on the international scene, Hayter finds "a lot of serious work. . . . And it's all very healthy; you no longer have to be in style." However, he consistently deplores certain mixtures of art and money. And he continues to feel that "being a salesman and being an artist have got to be kept separate." It is no secret that he, himself, has never been rich. Hayter's style has been to be generous, with his knowledge, his time and his affection.

At 76, he's as full of vitality as a youth; his blue eyes are amused and discerning, his hand dexterous with burin and brush. He is surrounded by an admiring group (many of them younger than his two sons), by old friends, by attractive women. He continues to talk up a storm, laugh long and loud, travel, play tennis with his old buddies—in short to gustily savor the pleasures of life to which he has so long accustomed himself. And, above all, he is still energetically engraving and painting—more the latter, now. The sense of a new discovery possibly lurking around the corner, the joy in the small and big wonders of the ordinary day, are still very much a part of his world on Paris' Left Bank, not far from his youthful stamping grounds.

Today's importance of printmaking owes much to Hayter and Atelier 17; his own work has been exhibited in major retrospectives. Here are two of his prints: *Birchtree* (above) and *Curtain*.

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By Robert A. Weinstein

The days when tall ships called at Puget Sound

Wheat and lumber brought them from all over the world, and a little-known photographer recorded them permanently

During the 1890s and the early 1900s, Wilhelm Hester, a German far from home, documented the sailing ships and men of the Pacific Northwest export trade in grain and lumber. His work consisted of taking and selling photographs at the Tacoma, Seattle and Port Blakely waterfronts, the latter (left) the location of one of the largest sawmills on Puget Sound. He was forced, most of the time, to make his pictures under difficult weather conditions, using heavy and awkward equipment. But brought to light after four decades in dead storage, they reveal an accomplished professional at work.

By Hester's day sailing ships had fallen upon hard times. Their glory years were over. The competitive pressures of steamships, faster, more dependable and capable of carrying larger loads, had reduced the number of available sailing-ship cargoes to a precious few. Puget Sound with its huge exports of lumber and grain proved to be one of the last refuges of the world's dwindling fleet of windjammers.

Yet for Hester there always seemed to be sailing vessels waiting to load cargoes. They were his subjects and their crews his customers. He knew them as well as a shepherd knows his flock. It made no difference to him whether they were British, French, German or Scandinavian; members of the crews were often friends.

In the winter of 1905, six tall ships tied up to load at busy Port Blakely wharf, across from Seattle.

Photographs by Wilhelm Hester

Just starting his career as a marine photographer, Hester stood for this 1893 portrait in a studio.

For many Europeans, particularly Scandinavians, there was special comfort in the sights and sounds of Puget Sound. The visual similarity between this heavily timbered, wet meeting ground of the sea and the forest and their own homelands was considerable. But many of these men worried about steering clear of trouble, which for them meant the law. Fearful of all officialdom, they learned to be wary; being close-mouthed was the safest posture. Probing questions were discouraged; busybodies were severely frowned upon. Well-kept personal secrets such as "How old are you?" and "Where do you come from?" were safeguarded in the flyleaf of one's family or personal Bible.

These are some of the reasons we know too little about Wilhelm Hester. He was born in Germany, possibly at Oldenburg near Bremerhaven, on October 13, 1870, and came to America with his elder brother Ernst, settling in Seattle by 1893.

It might have been an easier life for Hester had he been a workman of the day, laboring on the ships or in the sawmills he frequented. He had not chosen an easy profession: marine photographer. Traveling to see and sell his customers and taking his pictures consumed much of a photographer's time. Searching endlessly for work to keep his struggling business alive, Hester was required to drive, sail and steamboat his way, day in and day out—in the gray fog, damp, cold, snow, sleet and the now-and-again sunshine.

Typical of Hester's pictures are these dressed-up, stiffly posed crews with the inevitable canine mascots. At the left is Captain Edward Gates-James, junior officers and apprentices. In the center,

We can almost see him lugging his 8-by-10 view camera firmly fastened to a heavy, ruggedly built wooden tripod, a leather case holding glass dry plates and wooden plate holders, flash powder and his contemporary version of a flash gun. Carrying his wide-angle lenses in a separate wooden box, order pad in his pocket, a morning newspaper for the newly arrived shipmaster in his hand, he would arrive on a ship's main deck ready for business. Forbidding weather, common enough on Puget Sound, afforded him opportunity to photograph below in the master's cabin or saloon—an almost unheard-of accomplishment for his time. There are no other known collections of maritime photographs anywhere that include more than a scant few, poorly lit, badly photographed views of a shipmaster's quarters.

In the master's cabin, the formal shooting finished, Hester and the captain might negotiate for a photograph to be made of the master's much-esteemed picture of his vessel. Rare indeed was the cabin that did not sport a framed photograph of the ship at anchor or a painting of her under sail, gleaming in new paint, the ship a thing of beauty and powerful grace. Hester's photographs of these paintings, carried to foreign lands, were effective silent salesmen; he often received orders from abroad.

On the afternoon of January 14, 1899, Hester photographed men of the crew of the big bark *Andelana*. The ship had arrived from China, discharged her ballast, and was waiting to load her promised cargo, 3,500 tons of wheat for the United Kingdom. Her holds were empty, swept clean. Easy to capsize without ballast to stiffen her, she was helped to remain upright at her anchorage by large floating ballast logs chained to her hull. The long dark night that followed brought vicious gale winds. In the morning the ballast logs still floated but the *Andelana* was gone, capsized and fast in the mud at the bottom of Commencement Bay, 23 fathoms below. The captain and her crew perished—not a man in the photograph (below) survived.

The sawmill site that especially fascinated Hester was Port Blakely (pp. 96-97), eight miles across Elliott Bay from Seattle. Deep inside a cool, thickly forested cove on Bainbridge Island, the loading chutes and bobbing catamarans of the Port Blakely Mill Company were the pivot for years for the export loading of lumber. The port was widely known to the world's windjamming sailors. John Masefield, England's poet laureate, recalled Port Blakely in recounting the history of the four-masted bark *Wanderer:*

"The ships were loading only choice logs from the first real cutting of the Washington forests. . . . The waste of the sawmills burned day and night in two

This article is adapted from the book Tall Ships on Puget Sound, the Marine Photographs of Wilhelm Hester, *published by University of Washington Press.*

officers and a beer-bearing steward of German bark *Ecuador*. And at the right, 15 of the 17-man crew of the *Andelana;* all drowned when their ship capsized the night after the picture was taken .

Hester left nothing to identify these comely women, presumably visitors on shipboard at Tacoma.

At Port Blakely in 1902, Hester photographed card game in captain's quarters of bark *Abyssinia*.

immense bonfires 'as high as houses. . . .' As ports went in those days the place was a good port, where sailors had fairly easy days and pleasant evenings. There were numerous temptations to desertion. In Seattle across the bay miners from Alaska would still pay for their drinks with gold dust or little nuggets."

Although Hester made many photographs of the ships and seamen of Puget Sound's waterfronts after 1900, it was becoming a part-time concern for him. He was turning increasingly to real estate speculation, perhaps using money he and his brother made in Alaska during the gold rush.

He seemed to enjoy barter, filling his time buying, selling and slowly accumulating all manner of curious objects. In his retirement, Hester lived in an old, rambling wooden house atop Capitol Hill in Seattle.

To his closest neighbors Hester appeared a genuine eccentric, largely because he filled the rooms of his home with boxed and barreled items and loose accumulations of every kind of material. They reported

Sailor's son dresses up to take the helm of the four-masted bark *Balmoral* in 1904.

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that one barrel contained 59 alarm clocks. Another was filled with six birdcages.

This zeal for saving everything may be the principal reason his negatives survived. Packed in wooden boxes, they awaited Hester's eventual disposition.

After Hester's death in 1947 his house was bought by Norah and the late Gerald Sands. Clearing up their new home, they eventually stumbled onto the wooden boxes containing more than 1,350 of Hester's glass-plate negatives. For more than 40 years after Hester had quit photography, his collection of negatives and prints had lain there in the house, neither organized nor catalogued. The boxes containing the photographic plates were not tagged, nor were the nondescript, sagging cardboard cartons piled high with his mounted prints identified in any way.

In time, a major part of the collection went to the San Francisco Maritime Museum and a cache found later was bought for the special collections department at the University of Washington library.

It is doubtful that Wilhelm Hester ever consciously set out to make artistic photographs. No definite record exists of his membership in any photographic society, nor does any surviving correspondence indicate his interest in esthetic matters. For him photography was all business.

The wonder of his work is that it is not exclusively a brilliant record of Puget Sound shipping and seamen. Many of his images prove the universality of the artistic impulse in mankind. We are enriched as were his contemporaries by the vivid products of his commercial labors.

British windjammer *Drum Blair* shimmers in the fog while anchored in Commencement Bay, Tacoma.

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Krakowskie Przedmiescie Street, near Castle Square, has risen from the rubble, below, that Hitler's troops created—and meticulously photographed. St. Anne's Church is restored from blackened ruins

to prewar splendor. The underpass, known as the East-West Thoroughfare, did not exist before the war.

By Tad and Marianne Szulc

Rebuilt Warsaw has put its best centuries forward

With the near-completion of the Royal Castle, the once-dead Polish capital is being restored to its former brilliance

This is the tale of the rebirth of a great city. It begins on January 17, 1945, when armored spearheads of Soviet and Polish forces forced Nazi troops to abandon Warsaw. Liberation had come at last, but Warsaw, once-proud capital of Poland, had ceased to exist.

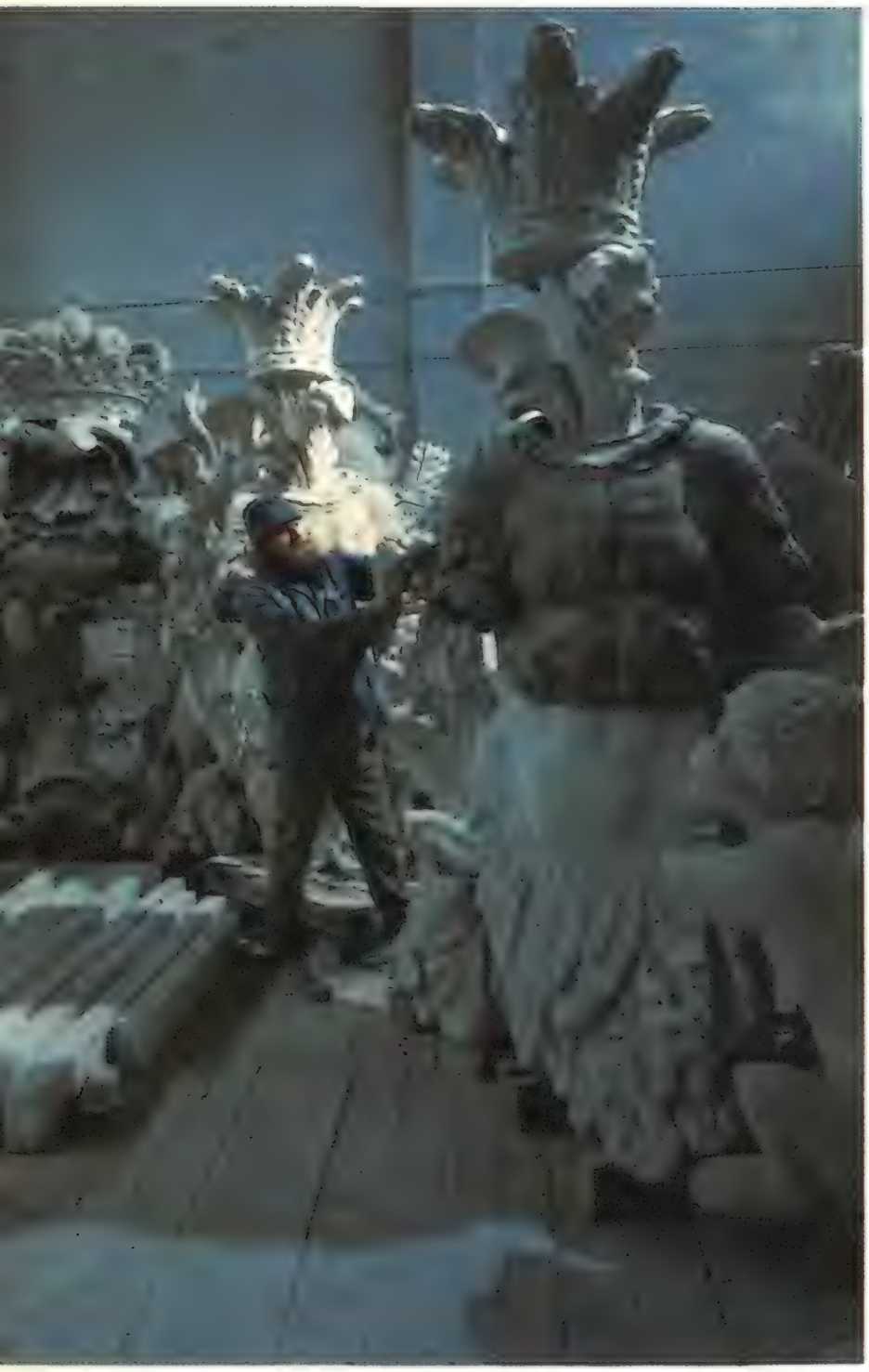
The previous fall, a desperate two-month-long uprising by the Polish underground had been smashed by the Germans. On Adolf Hitler's personal orders, the 700-year-old city had been savagely and systematically dynamited and burned to the ground, street by street, house by house. Of more than 25,500 structures standing when World War II erupted, only 4,225 survived.

Of Warsaw's prewar population of 1.3 million, only a few hundred people remained, hiding in caves, amid ruins, and among corpses in the frozen wasteland. Some 700,000, mostly Jews, had been deported earlier to concentration camps. About 400,000 were killed in the fighting and by execution. Tens of thousands died in the Warsaw ghetto revolt of 1943. And some 160,000 survivors of the 1944 uprising were evacuated to a concentration camp in Pruszkow, seven miles to the west, as Nazi demolition units drilled holes for dynamite charges, doused buildings with gasoline and, methodical as ever, filmed the explosions and arson. In all, six million Poles perished; Warsaw counted more than 700,000 dead—nearly twice as many as Great Britain.

Warsaw-born Tad Szulc is the author of many books, the most recent being The Illusion of Peace, *and was a foreign correspondent for the* New York Times.

Color photographs by Dmitri Kessel

Rebuilt castle nears completion



Wall ornaments are refashioned for Royal Castle. The original pieces have been darkened by time.

Royal Castle, or Zamek, last of the old buildings to be restored, stands behind King Sigismund's Column. Figure dates from 1644; it was blown up exactly three centuries later, reerected in 1949.

This part of Royal Castle, the northern courtyard entry hall on ground floor, was built during reign of Sigismund III, who transferred Poland's capital from Cracow to Warsaw at turn of the 16th century.

Hitler demanded that Warsaw become a dead city. He succeeded for a time, as apartments and office buildings, theaters and schools, churches and museums and historic castles and palaces, some dating back to the 13th century, were razed. Among the latter was the Royal Castle—the beloved Zamek—which Mazovian princes first erected in wood in the late 1200s, and the adjoining Old Town with its rows of burghers' houses.

The liberators entered a ghost city. Not even a bird sang amid some 720 million cubic feet of rubble, punctuated by an occasional blackened wall fragment and cut by canyons that had once been streets.

Today the restoration of Old Warsaw to its prewar appearance—a miracle of human tenacity, scholarship and technical skill—has been completed. The official opening of the newly reconstructed Zamek, symbol of Poland's nationalism and culture, will be in 1980. When we visited the Royal Castle recently, a final coat of painted stucco was being applied to the rebuilt exterior; inside, artisans were busy with marble and oak floors, cornices and ceilings.

The famous Canaletto Room, named after the Venetian artist (his real name was Bernardo Bellotto) who was King Stanislaw August's court painter between 1767 and 1780, will be decorated again with his 23 famous Warsaw paintings. All the Canaletto works were removed to a Bavarian castle during the war, but were later recovered and often served as working models for the architects who planned the reconstruction.

Varsovians wept as clock again chimed

Although some scaffolding work is still visible, the exterior of the castle, including its central tower, was declared "officially" finished four years ago: the ancient tower clock chimed again at 11:15 A.M. on July 22, 1974, the exact hour when it stopped as German bombs hit the castle on September 17, 1939—16 days after the Nazis first struck. Tens of thousands of Varsovians stood weeping on the Castle Square and in the streets beyond when they heard the clock's chimes. Nothing better indicates the civic emotion that overrode financial, political and ideological considerations and produced Warsaw's restoration.

The Old Town—Stare Miasto—was partly restored by 1953 with the reconstruction of its 14th-century walls; by 1963 some 350 other buildings and churches nearby looked exactly as they did long ago. The rebuilders were determined to bring out the most precious of the Old Town's ancient features—the Square, or Rynek—and to do away with later accretions.

Similarly reconstructed were two main thoroughfares, the elegant Krakowskie Przedmiescie (pp. 106-107) and Nowy Swiat, along with most of the famous palaces and churches on adjacent streets and avenues.

Figure of Christ the Martyr again bears its burden (right) outside Holy Cross Church, first built in late 1600s. Nazi photograph of ruin, above, gained fame for Savior's haunting gesture.

One of these was the Borch Palace near the Old Town, which now serves as the residence of the Roman Catholic Archbishop, Primate of Poland. Another was the spectacular late-Baroque palace, first built in the mid-17th century and rebuilt by the princes Radziwill a century later. It now houses the Council of Ministers of the Polish People's Republic.

In all, more than 1,000 structures have been reconstructed—926 of them classified as historical monuments—along with dozens of statues, including Frederic Chopin's monument in the royal park of Lazienki and that of Nicolaus Copernicus on Krakowskie Przedmiescie. When the Nazis blew up the Holy Cross Church, the smashed statue of Christ lay in the rubble, one arm pointing up to the heavens (above). Now, the church has been rebuilt.

Besides the reconstruction, a modern new city now rises around Old Warsaw, complete with high-rises, freeways, tunnels and bridges. The population has reached 1.5 million, and the city's overall area has nearly quadrupled from prewar years.

On the day the Germans left, thousands of Varsovians poured back through the snow to their city. As Stanislaw Lorentz, dynamic 79-year-old director of the National Museum and a moving force in the reconstruction effort, reminisced, "Rebuilding started the moment the first person picked up the first piece of rubble." Lorentz himself was one of the first, returning the day after liberation, setting up his home and office in the cellar of the partly burned-out museum.

The first returning inhabitant of the Old Town, where some of the fiercest hand-to-hand combat had occurred during the 1944 uprising, was an old woman. Nobody remembers her name, but she became known as the "Lady of the Pigeons." Hanna Szwankowska, curator of the Historical Museum of Warsaw on Old Town Square, recalled that "she came out of nowhere and moved into a cave in the ruins of a building on Piwna Street, just off the square. All day long, she sat on a piece of broken stone feeding pigeons, you know the pigeons we always had and still have in Stare Miasto. After a while, people started bringing her dried-up bread for her pigeons. In a crazy way, she personified the rebirth. She died maybe 20 years ago. But if you walk over to Piwna, you will see blue pigeons painted on the facade of the building now standing on

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the site of her ruins. This is the only personal tribute to anybody in the restoration, the only liberty taken with authenticity."

The decision that Warsaw should remain the Polish capital despite its nearly total destruction was made on January 3, 1945, by the Communist-backed provisional government. Actually, Soviet troops had reached the Praga suburb and were encamped on the right bank of the Vistula River, which bisects the city, as early as September 14, 1944. To this day there is great deal of bitterness among Poles that the Russians remained passive during the August-October uprising, which occurred on the river's left bank, the heart of Warsaw. The accusation is that the Soviets preferred to let the Polish anti-Communist underground forces be destroyed by the Germans so that there would be nobody left to oppose the ultimate Communist takeover. The Soviet answer is that an offensive was militarily impossible—and that, anyhow, the revolt was premature.

The hundreds of thousands of exiles streaming back to their hometown demanded that Warsaw be rebuilt with its historic mantle intact. The new government had to go along with it. Thus, paradoxically, a Communist regime at the height of Stalinism, faced with immense problems of setting in motion the life of a whole prostrate nation, made one of its top priorities the resurrection of everything that stood for the old political order: great churches and palaces of the nobility, ancient houses that epitomized the small bourgeoisie, royal parks and gardens with their precious pavilions, theaters and statues of rampaging stone satyrs and mermaids. As Professor Lorentz remarked, "The worst thing that can happen to a culture is the loss of its continuity . . . that's why Warsaw had to be rebuilt the way we did it."

The regime did balk at the rebuilding of the Royal Castle, with its 450 rooms and halls, even though Parliament in 1949 had voted for it. The job was costly and there were, besides, the political connotations. So the decision to go ahead with the Zamek had to wait at least another two decades for a more salubrious political climate. When Edward Gierek, most liberal of Poland's Communist leaders, came to power in late 1970, he ordered the Castle's reconstruction as an early, highly popular move. Instantly, a nationwide fund-raising campaign was launched. Today, Gierek proudly

St. John's Cathedral, built in late 13th century, took decade to restore (left) after the Germans blasted it (above). Linked to the Zamek by walkway, it was once used for royal weddings and baptisms.

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Rebuilt castle nears completion

guides visiting dignitaries through the magnificent rooms where Polish kings ruled from the end of the 16th century until the country's partitioning in 1795.

Despite its spontaneous start, Warsaw's restoration has been a fully thought-out and highly scholarly undertaking for which specialists were prepared. In 1939, after Warsaw fell, Polish underground leaders learned of the so-called "Pabst Plan," named after one of Hitler's architects. It provided for the destruction of most of the city and the modernization of the downtown area, including the Old Town, as a small city—a *deutsche Stadt*—of 120,000 ethnic Germans. The castle itself was to be destroyed. Everything else on the left bank of the Vistula was to be leveled. The needs of the new German city were to be served by a community of 500,000 Poles, including 30,000 Jews, kept in virtual slavery across the river in Praga.

It was in reaction to this project that Polish architects, art experts and historians began to plan, in underground meetings and even in concentration camps, the eventual restoration of Warsaw. The new architects, after liberation, could not depend on people's memories to create a replica of Old Warsaw. So Lorentz, who had been director of the National Museum since 1936, organized, as chief of the underground's cultural section, what can be only described as a culture intelligence network.

Its first task was to move secretly to the basement of the National Museum all the materials—plans, drafts, descriptions and photographs—from the archives of the Conservator of Warsaw and of Warsaw Polytechnic's architecture department. The combined archives were a treasure trove of everything that pertained to the historic buildings and monuments. Before the war, architecture students had catalogued most of the important structures, and this was to prove invaluable. The parallel job of Lorentz's cultural underground—among his closest associates were Jan Zachwatowicz and Stanislaw Herbst—was to keep track of all the art objects the Nazis were shipping back to Germany.

"We were able to make an inventory with sketches, photographs and descriptions of, for example, more than 5,000 church bells that the Germans collected at a depot in Warsaw before shipping them west," recalls Lorentz, who risked his life on many occasions to save the works of art. "Polish railroadmen helped us, and thus we knew where every bell went. Some were melted, but we rescued others after the war."

Working against the "final solution"

Hitler dropped the idea of his Warsaw *deutsche Stadt* and for five years Warsaw lived under a temporary suspension of execution. Except for the Jewish ghetto, the city was left pretty much alone. But with the collapse of the October 1944 uprising and Hitler's order for a "final solution" for Warsaw, Lorentz and his colleagues knew they had to try to keep a record of the destruction.

When the famous Krasinski Library was set afire later that month, the Lorentz team spent hours in the snow picking up priceless bits of burned volumes. Then Lorentz and his friends were sent to Pruszkow. Their greatest worry became the archives in the basement of the National Museum.

Knowing that the Germans were removing everything from the historic buildings they were about to blow up, the Polish team volunteered to supervise the packing. Somewhat surprisingly, the German commanders agreed, and every morning Lorentz, Zachwatowicz, Herbst and the others were taken under guard from the Pruszkow camp to Warsaw's National Museum and other condemned buildings. Supervising the packing, the Poles were able to keep track of the destination of the works of art, but, even more importantly, they were able to smuggle out the valuable archival records. Lorentz told the story:

"A special team under Zachwatowicz and Herbst removed the archives from the National Museum when the building was already on fire. We had bribed *Volksdeutsche* (ethnic German) truck drivers to take the archives to the little town of Brwinow where they were hidden in the local firehouse. The firemen were our friends. Then the Germans became suspicious. We had to move the archives again. We came up with a rather romantic idea of sending the collection to the monastery of Bernardine monks in Piotrkow. It was a strange place. In the catacombs of the monastery there were tombs of Bernardine monks who had lain there for centuries. With the monks' permission, we hid the archives under the tombs. The Germans, of course, never ventured there. In March 1945, we triumphantly

Rynek, or Old Town Square, of Warsaw was restored in 1953. Traffic is barred and outdoor cafés flourish.

Square was in total ruins when Germans left (below). Restorers brought it back to richest era, early 1600s.

brought the archives back to Warsaw. These were the materials that made everything else possible. Without them, reconstruction would have been a work of memory, fantasy, and reliance on sundry photographs."

Tadeusz Szumielewicz, who now holds the office of the Architect of Warsaw, said that the basic agreement was to rebuild the city according to the historic concept of the Royal Tract. This is a 22-kilometer axis running from Wilanow, the summer residence of a Polish king and queen south of Warsaw (and where President and Mrs. Carter spent a night during their Warsaw visit last December), to the Royal Palace and the Old Town.

The Old Town did not belong to the Royal Tract but, as Szumielewicz explained, it formed an "urbanistic ensemble" with the Royal Castle and thus had to be rebuilt. The New Town—Nowe Miasto—was relatively new as Warsaw's history goes (it developed in the late 14th century) but, since it merges with the Old Town to the north, it formed a part of this ensemble and, consequently, had to be reconstructed as well.

Szumielewicz recalled the incredible start of the rebuilding: "People looked for a corner to live—a door, a window, something to build, something to fix. God, there was enthusiasm! There were no Saturdays, no Sundays, no holidays. They picked up the bricks and built. But you have to know Warsaw. Every Pole is in love with the capital. Not that she's so beautiful, but so emotionally linked to tragedy."

People pried old mortar from bricks to preserve it for subsequent reconstruction. A special factory was established to turn out bricks of one particular kind for St. John's Cathedral (p. 112) and of another kind for the castle. Artisans rushed in from all over Poland to help in the reconstruction. "It was fantastic," said Szumielewicz. "Dying old people were teaching the young how to mortar, plumb, paint or gold leaf. We took advantage at the last moment of the old generation of artisans."

The new artisans were much in evidence when we toured the semicompleted interior of the castle one day. The young men and women, many of them architecture students, moved right behind the workers who placed the beams, erected walls and laid the floors. Their job was to install marble and oak parquets, mantelpieces, mirrors, boiseries, window frames, "false marble" columns, gold-leaf trim and every bit of ornamentation that once existed in the Zamek. And no shoddy work was accepted: we saw signs ordering the tearing up of an exquisite parquet because it was less than perfect. A beautiful mirror was to be replaced because it had a virtually invisible flaw.

Now that the Zamek is nearing completion, little remains to be done to complete the restoration of the cultural heritage of Warsaw, the city whose overwhelming and unique passion is old architecture. The Old Town Square—the Rynek—is now Warsaw's principal tourist attraction with its 42 stone buildings housing museums, restaurants and wineries, and art galleries (p. 115). Thirty-four years after Hitler's order to destroy Warsaw forever the city is back in its full splendor, an extraordinary blend of reality and illusion.

Freta Street, rich with churches, leads to Warsaw's New Town. The 1945 photograph above shows what Nazis left. Today (opposite) rebuilt Dominican Friars' Church faces the Paulites' Church, still scaffolded.

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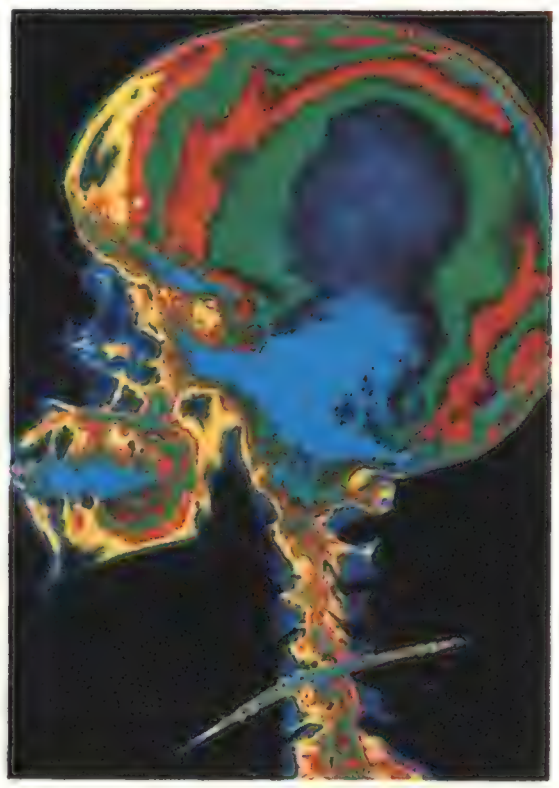

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By Willard Sterne Randall

At southern tip of New Jersey, a gingerbread spa

Narrowly escaping modernization, Cape May —now a gem of architectural restoration— has become a National Historic Landmark

Badly knocked about by fury of the 1962 winter storm, this stretch of houses along Beach Avenue is now in good shape.

For three days the northeaster pounded the New Jersey seacoast, hurricane-force winds piling unusually high tides into its back bays. Finally, the estuary could absorb no more, overflowing the fragile strand of offshore barrier islands, the water surging through the streets. By the night of March 7, 1962, the full moon starkly highlighted 130 miles of ruined seashore resorts —the worst damage suffered in more than a century.

At the state's southern tip, where the Delaware River Bay meets the Atlantic Ocean, Cape May, one of the oldest American seaside resorts, suffered terribly, its boardwalk strewn by the wind, its convention hall dangling in the surf. Along Beach Avenue, where five Presidents promenaded among the royalty of Europe and the upper crust of 19th-century society, the resort's premier hotels and gracious Victorian frame cottages were flooded, roofless and filled with sand, dead fish and sewage.

Less than a year after the floodwaters receded and the long cleanup commenced, a new tempest, potentially of far greater import, engulfed the 2.2 square miles of Cape May. Arrayed against businessmen and politicians in favor of bulldozing boarded-up old buildings was a small coalition of summer residents and local civic leaders. Their tenacious spokeswoman, architectural historian Carolyn Pitts (p.122), perceived a unique opportunity to restore and preserve an entire historic district of about 600 inhabited wooden structures surviving from the Gingerbread Age.

To practically everyone's surprise, after a vociferous 15-year struggle, pro-Victorian forces seem to have defeated the Philistines. In October 1977, many of Cape May's nearly 5,000 year-round residents, their homes meticulously restored, proudly assembled at a ceremony in their new convention hall as the entire city was designated a National Historic Landmark—the highest honor to be officially bestowed on an American cultural property.

In the early days, Cape May (named in the 1620s after Dutch explorer Cornelis Jacobsen Mey) clearly belonged not to the nation but to the fishermen—first Indian oystermen, then unemployed New Englanders pursuing whales. After 1699, when the local citizens attracted official notice by lavishly entertaining four pirates, it belonged to the innkeepers.

Among the first was Ellis Hughes, who in 1801 advertised the first sizable structure erected exclusively for overnight guests. The 95-mile passage by sloop from Philadelphia was, at best, erratic, often taking six days, so Hughes provided directions by coach through forests of pin oak, cedar, slash pine—and mosquitos. Then, as now, the ride to the seashore was exasperatingly slow, hot and tiresome, with accommodations at the far end less appealing than the ones ad-

Order, decorum and fantasy are combined in 19th-century row of cottages in what is known as the American Bracketed villa style.

Photographs by Farrell Grehan

New Jersey's gingerbread spa

Historic preservationist Carolyn Pitts led 15-year campaign to save town from bulldozer.

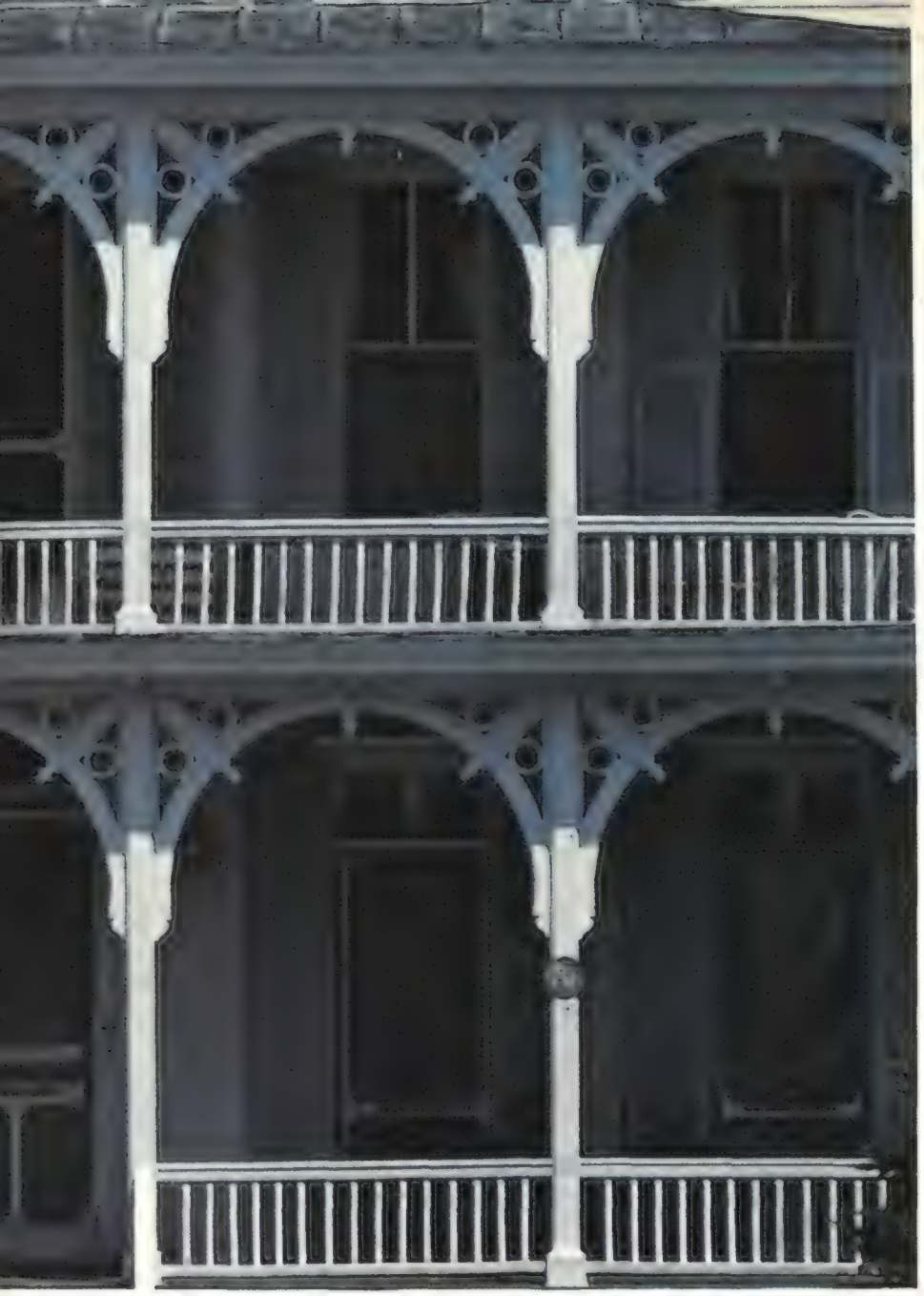
Symmetrical design, but embellished with fine arabesque scrollwork, distinguishes Edward

vertised. Hughes' establishment was little more than a 50-foot-square unplastered barn where, after a day's fishing or splashing in the surf in old clothes, guests ate and drank from a common table and then, with blankets strung up to segregate the sexes, they could hope for a good sleep in the cool breeze.

By the 1830s, eroding sands had already forced the first ramshackle beachfront hotel to be moved back; Commodore Stephen Decatur, improving coastal defenses, measured a 14-foot annual attrition rate. This failed to stem the tide of tourists flooding the small town, arriving at the rate of 3,000 a day in July and August by the 1850s. They crowded into small, spare rooms, usually six by nine feet with two or three beds and a table. In 1832, the Mansion House, the resort's first plaster-and-lath hotel, opened.

Until the Civil War, Cape May, almost as far south as the nation's capital, was a favorite plantation-owners' resort. Its habitués flocked north by railroad and steamboat with wagonloads of luggage, slaves and

Mr. Randall, author of a forthcoming book, The Franklins, *is also working on a history of Cape May.*



C. Knight Cottage (1882-83), a stylistic hybrid—yet it's both spacious and inviting.

gold coins. The bone-wrenching journey made that first swim all the more refreshing, but Victorian conventions were observed even in the water: women went first under a white flag; men had to wait until they left and the red flag unfurled.

After a late lunch, the corseted ladies tried to keep cool on long verandas or in sitting rooms while the gentlemen, especially the Southerners, played cards at one of the notorious gambling establishments (p. 129), sharpened their dueling skills at pistol galleries or wagered on horse races on the beach.

Still no match for more pretentious rivals like Newport and Saratoga Springs, Cape May, as one proper Philadelphian noted in 1847, was "a little town of large hotels which are comfortable and well kept . . . the objection to the place is the vulgarity of the society. . . . "(No doubt he would have disapproved of a tall, obscure Congressman checking into the Mansion House with his wife two years later, but then Abraham Lincoln, on a Whig campaign tour, did not choose to spend much time among the slave owners.)

The summer of 1847 brought the "vulgar" week-long visit of Henry Clay, disconsolate over the death

Decorative hoods shade windows of the Colonial Hotel (1894-95). The style is so-called Second Empire.

Douglas Gregory House was built in 1882. Mansard roof and ornamental porch are typical of the time.

of his favorite son and seeking isolation. What he got instead was a welcome by thousands of well-wishers rushing in from a hundred-mile radius. Clay's surf-bathing was invariably disrupted by the ladies who, according to one account, would "catch him, and with a pair of scissors carried just for that purpose, clip locks from his head. . . ." It's said that when he returned to Washington, his hair was "very short indeed."

Cape May's grandeur reached its peak in 1853 when the world's largest hotel, the Mount Vernon, opened. Named for the Virginia plantation then being threatened with commercial exploitation, the four-story structure had vast porches overlooking the ocean, jigsaw-decorated pillars, brackets and bargeboards, and, when completed, was to provide rooms for 3,500 guests and places at table for 2,500. In 1856, before the last wing could be finished, it burned to the ground—not surprising, considering that the place was lighted with gas manufactured on the premises.

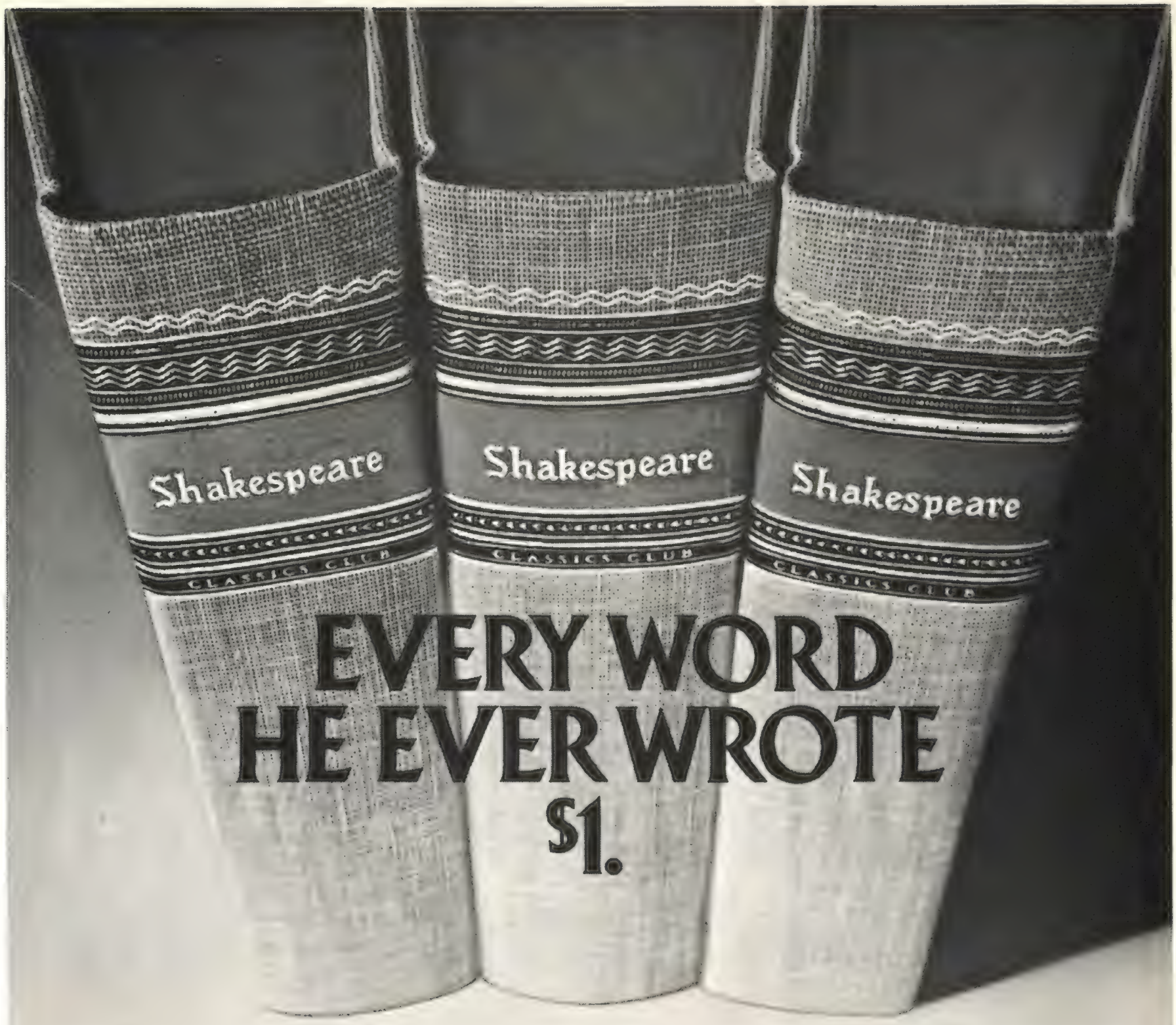
President Franklin Pierce became the first chief executive in office to visit the resort in 1855, and the list of vacationing dignitaries would grow to include the Empress Carlota, mourning her husband Maximilian's execution; the British beauty and actress, Lillie Langtry, walking alone on the promenade; Bret Hart and Owen Wister, working on Wild West fiction; and Clara Barton, lecturing newspaper editors.

Resort becomes summer White House

One July day in 1869, a newly elected President, U. S. Grant (who apparently would endure three more Cape May visits so that his wife could splash about in her custom-tailored red-and-blue flannel swimsuit), reviewed the Philadelphia Grays—not once but twice. Perhaps the shortest Presidential stopover was by Chester A. Arthur in 1883. After dinner on the day of their arrival, the President and his wife came down to dance to the hotel's house orchestra, but found little leisure, shaking 2,500 hands before departing by boat to a splendiferous midnight fireworks display.

In 1890 President Benjamin Harrison made the Congress Hall, by then the resort's most famous hotel (and still standing today), his summer White House. Postmaster-General John Wanamaker presented the Harrisons with the keys to a fine cottage in secluded Cape May Point and the President commuted by electric train to his offices in the big hotel.

The major attraction in Cape May's High Victorian period may have been gambling, but the staple entertainment was music. One August day in 1882, the United States Marine Band swung into town with John Philip Sousa at its head. Every evening that week, the 27-year-old bandmaster led off concerts with his newly composed *Congress Hall* march on the ho-



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tel's crowded six-acre lawn. Farther up the beach, gangs of mules and men were sweating to erect another spectacle, a 1,000-foot-long iron pier. On opening night in 1884, couples waltzed at a shimmering gaslighted grand ball in the music pavilion out over the ocean.

Crowds delighted most visitors but, after 1860, well-to-do Philadelphia Main Liners, who owned the excursion railroads and steamboats, found packed, overflowing hotels far from exciting. All that would do, of course, was to build one's own cottage—preferably as large and stylish as one could afford.

Millionaires competed for the town's best builders and master carpenters and for Philadelphia's finest architects; their combined efforts gave Cape May an unparalleled ensemble of late-Victorian architecture. Samuel Sloan, then nationally known, designed a handsome bracketed Italian villa behind tall hedges and a gracious curving drive for merchant George Allen in 1863. Its rich exterior carving and capacious salons reflected Victorian luxury according to the dicta of Sloan's two-volume *The Model Architect,* published in 1852.

A great deal of the architectural work went to Stephen Decatur Button, widely known in Philadelphia and very conservative. Button designed an impressive range of structures—from the elegant red-roofed Windsor Hotel on Beach Avenue to a private courtyard of prim cottages known as the Seven Sisters, decorously turning their back to pedestrians and carriages then—and to summer traffic jams today.

At almost predictable intervals, fires enveloped crowded rows of dry, wooden hotels, providing fresh opportunities for construction. The worst broke out in 1878. Fanned by high winds, it destroyed 30 acres of buildings. The hotel district never fully recovered.

Today, a sampling of surviving late-19th-century

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St. Peter's by the Sea is a good example of a stick ornament structure with tongue-and-groove siding.

Detail of three-story colonnaded Chalfonte Hotel with verandas on all sides and lots of trim.

frame structures shows virtually every imaginable variation of lattice, scroll and fretwork, bargeboards and brackets, with architectural designs spanning eight major styles generally considered to be under the Victorian influence. Beneath exuberantly competitive ornamentation, Cape May's houses were designed with summer always in mind: long porches and balconies for rocking chairs, shaded high windows opening to the sea breeze. Evidently most popular among newly rich merchants and bankers was American Bracketed, a graft of Renaissance Revival onto the Italian villa style (p.120).

Townspeople's shock of recognition

"The independent carpenter-builders used pattern books and textbooks, improvising on what they thought were traditional designs," said Carolyn Pitts. "Their hybrid often contained 50 different styles that can best be classified as the 'Picturesque' styles Americans then held to be the height of fashion." Houses were painted "harmonious" earthen colors, such as terra-cotta or beige with darker trim. A classic example is the Physick House (p.126), the first building in town repainted in the Victorian era's muted hues.

Smoldering a century ago just beneath Cape May's refined veneer was antipathy between many year-round residents, who alone could vote, and summer vacationers, who owned two-thirds of the property, paid most of the taxes but had little say about how things were run. When terrifying fires still left locals reluctant to buy adequate fire equipment, wealthy out-of-towners formed a cottagers' association. Its members still couldn't vote, their political impotence reflected in Cape May's failure to seek exclusion from the state's antigambling law and in a local referendum banning liquor sales. As a result, Cape May after 1900 began to dry up as a resort, much of its clientele shifting to new watering (and now gambling) holes such as nearby Atlantic City.

There was one last great public spectacle in the Victorian era, drawing the largest crowd of all. In August 1905 the world's top racing car drivers converged on a hard-packed Cape May beach to compete for a $1,000 prize. Races ran all week, 20,000 waiting for Henry Ford's 60-horsepower "Beach Skimmer" to arrive: it had been shipped to Buffalo by the railroad by mistake. As onlookers cheered, the fastest cars of the day roared along the waterline, one actually running out into the ocean—narrowly escaping a serious accident. The popular favorite was Walter Christie's 130-horsepower "Blue Flyer," but the spoiler proved to be Louis Chevrolet's big black 120-horsepower Fiat, setting a new mile mark of 51 4/5 seconds.

Paradoxically, it was the automobile which almost

The Main Stay Inn was once Jackson's Clubhouse in the days when it was popular with gamblers.

Grand parlor of Main Stay Inn today looks much as it did in 1870s. So do other rooms in the inn.

destroyed Cape May's Victorian heritage. When local officials embraced multimillion-dollar federal Urban Renewal relief, they decided to make more room for cars, even at the cost of tearing down old buildings, including several of the finest hotels. In 1967, the Colonial, popular with Baltimore society (Wallis Warfield, later Duchess of Windsor, was given a reception there in 1917), sold off its annex, the Star Villa, for $1 to make room for a parking lot. The buyer was the Reverend Carl McIntire, the Fundamentalist clergyman, who was smitten with the old hotel annex and its star-pattern woodwork and paid $30,000 to have it cut into two pieces and trucked up Beach Avenue to join other historic houses he had salvaged.

But by early 1963, when an Urban Renewal city planner subcontracted Carolyn Pitts to catalog the town's buildings, few beside her and a handful of others still cared to fight to preserve the resort's authentic Victorian character. Her exhaustive house-by-house research proved over the next 15 years that the entire town had strong historic value, something most residents hadn't even suspected (to them, she said, they were "just old buildings and a problem"). The findings embarrassed local officials already busily demolishing and replacing vintage structures with such anachronisms as "Victorian" garden-court apartments

and high-rise public housing. Miss Pitts' well-publicized research also stirred local activists, such as Dr. Irving Tenenbaum, to start installing gaslights (there are now 139) along the streets of the historic district and to organize a "historic renewal" conference sponsored by the National Trust for Historic Preservation.

City officials largely ignored preservationists until 1967 when Arthur "Mickey" Blomkvest, a master carpenter who had repaired many of the fine old buildings, learned that the city was going to permit a Ferris wheel on the beach. Outraged, he ran for city council on the "historic values" issue, and won. Today he is not only one of the town's most outspoken preservationists but its mayor.

And the very determined "Miz Pitts," as the townspeople now call her, has successfully carried out her seven-year scheme to make a painstakingly measured documentation of the most important old buildings (she also was responsible for the recent publication of a *Cape May Handbook* to aid individual building owners in restoration and also to be used as an integral part of a long-range preservation plan for other communities). During recent summers her teams of University of Pennsylvania architects and architecture students, historians and photographers have swarmed over the old houses, churches, cottages and hotels with the fervor of archaeologists at a major new dig. Now, should fire or flood—the darkest chapters of the old seaside resort's history—recur, there will soon be detailed drawings to aid in their reconstruction on deposit in the Library of Congress.

Gas-fired streetlamps, which have become symbol of town-renewal project, were the first signal of success to local citizenry.

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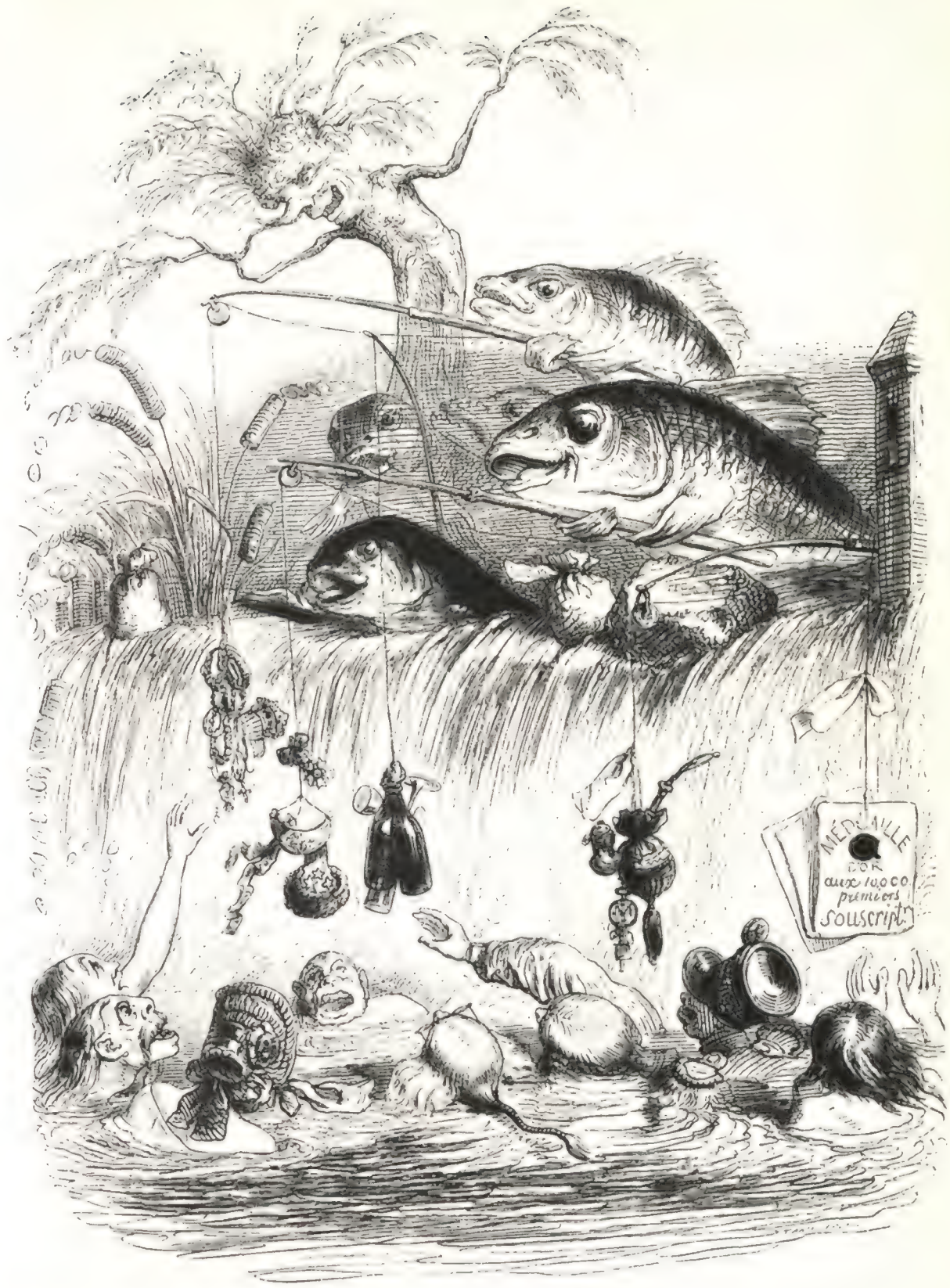
By Michael Olmert

J. J. Grandville's phantasmagoric view of humanity

This 19th-century illustrator pictured Man's follies and vanities with anthropomorphic mockery



One of *Un Autre Monde*'s travelers, needing money, writes *An April Journey*. In it, he describes a land where fish lure people with worldly goods and gold.

Jean-Ignace-Isidore Gérard, known as J. J. Grandville, a 19th-century illustrator and caricaturist, is being discovered by a new generation of admirers. There is a good deal that is universal and timeless in Grandville's work, as a recent book published by Dover Publications, *Bizarreries and Fantasies of Grandville,* shows. Given any collection of men and women in any society, it quickly becomes apparent that his mordant commentaries are applicable to whatever it is that happens to be going on. Nothing illustrates this better than—taken as a whole—today.

Grandville's earliest lithos reveal the two nudging elements that were to characterize most of his later drawings: a mocking display of fatuousness in French society and its charades; and the use of animals in human dress to decry Man's pretensions—both of the right and the left, the rich and the poor, the educated and the rustic, the fashionable and the hopelessly déclassé.

Although Grandville had been born in Nancy in 1803, it was not until the early 1830s that he could put his instincts fully to work—as a cartoonist with France's earliest political humor sheets, *La Silhouette* (closed down by the "Citizen King" Louis-Philippe in 1831) and *La Caricature* (which likewise was forced by the government to close its doors in 1835). At *La Caricature,* Grandville worked alongside another young illustrator who would later make his mark on the world, Honoré Daumier. After the repressions of 1835, it was apparent that political art could no longer support the caricaturist. Both publisher and reading public found it too dangerous a commodity. For Grandville, book illustration became a more stable source of income. Over the next 12 years, he turned out nearly 3,000 such drawings.

The coming of the industrial revolution, a middle-class public that had both the leisure and the discretionary income to spend on a penny paper or an illustrated book, and improvements in printing practices—all contributed to the demand for men with Grandville's talents.

For book illustration, the wood-engraving technique gradually became the favored process. Grandville was fortunate in having publishers who hired the best engravers available. Their signatures are often visible at the bottom edges of the illustrations.

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Michael Olmert, who wrote about Pope Clement's library in January 1978, is a student of 19th-century printed books.

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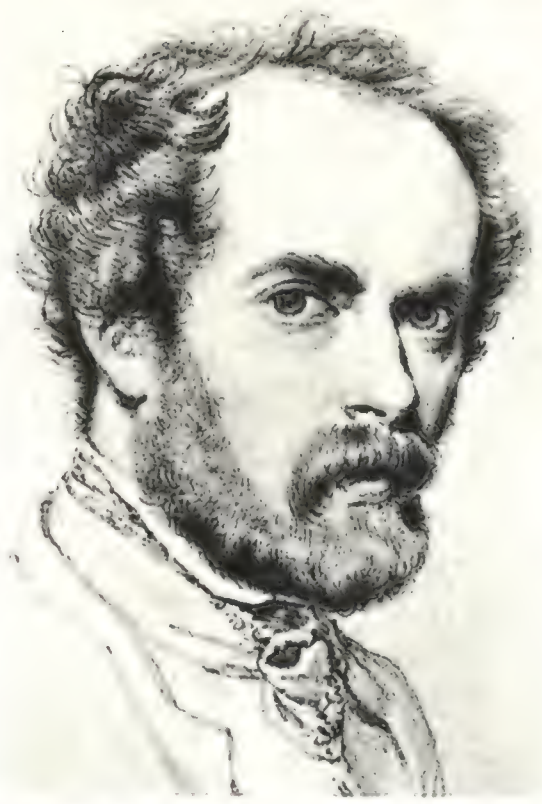

Self-portrait in pencil. Many topical drawings included word-play, puns.

ensured Grandville's fame, *Scènes de la vie privée et publique des animaux* (Scenes of the private and public life of the animals). The book's publisher, Pierre-Jules Hetzel, seems to have conceived the book purely as a vehicle for the art of Grandville. It consists of short stories by some of the day's most illustrious authors: Balzac (four stories), playwright Alfred de Musset, critic Jules Janin, literary doyen Charles Nodier, theatrical director Louis Viardot and novelist George Sand (although her contributions may have been written by Balzac). Hetzel himself, under the name P.-J. Stahl, wrote a number of episodes.

In *Les Animaux* Grandville finally had a chance to show in an extended work all the characteristics that had signaled his earlier illustrations. His animal scenes were crowded with details from his intimate knowledge of natural history and his lifetime of observing a certain plodding primate, Homo sapiens. These details of animals and Man were combined in a dreamlike atmosphere, an environment mapped by fancy rather than by mere cartography.

The framework of the tale is simplicity itself. The animals in the Paris zoo, the *Jardin des Plantes,* initiate a revolt. And why not? The humans of France had overthrown their masters several times in those days—and were to do so again be-

fore midcentury. The revolutionaries elect Grandville as an honorary animal and enlist him to illustrate the history of their republic. (The drawing on p. 136 shows the first number of the animals' story hitting the streets. Note Grandville's initials on the satchel.)

So much for the framework; each animal then contributes his tale. A magpie records the story of a hare who, in the course of Tom Jones wanderings, encounters a threateningly plump landlord, Mr. Vulture, and a dueling rooster.

Similarly, later tales detail the loves of an English cat, the troubles of Lord Byron's intellectual bear who decides he'd rather be a simple family man, and a volvox epidemic in the tiny world of the scale insects.

Les Animaux also includes three parallel stories that deal with hubris, which apparently was rampant in the Paris zoo as it was in ancient Greece. In the first tale, the ravens go to medical school, convinced they can do better than their previous veterinarians. Their efforts come to grief. In the second, a famous drama critic's pet dog dies of boredom after adopting the life of a reviewer. In the last story, an artist's assistant, a Brazilian monkey, attempts to trump his master by setting up shop as a daguerreotypist. Unfortunately, his prints are found to be far from charming, and his method of making clients sit still for the slow cameras of the day—chairs with neck and arm cuffs—smacks more of public punishment than art. A sign above one such sitting reads "2 seconds of public exposure."

Granville's look inside the medical school hospital shows (p. 140), as teaching surgeons, a shark and a sawfish. Rats, ravens and buzzards are the students. A

In Grandville's world, one is not surprised to see a dog walking his man.

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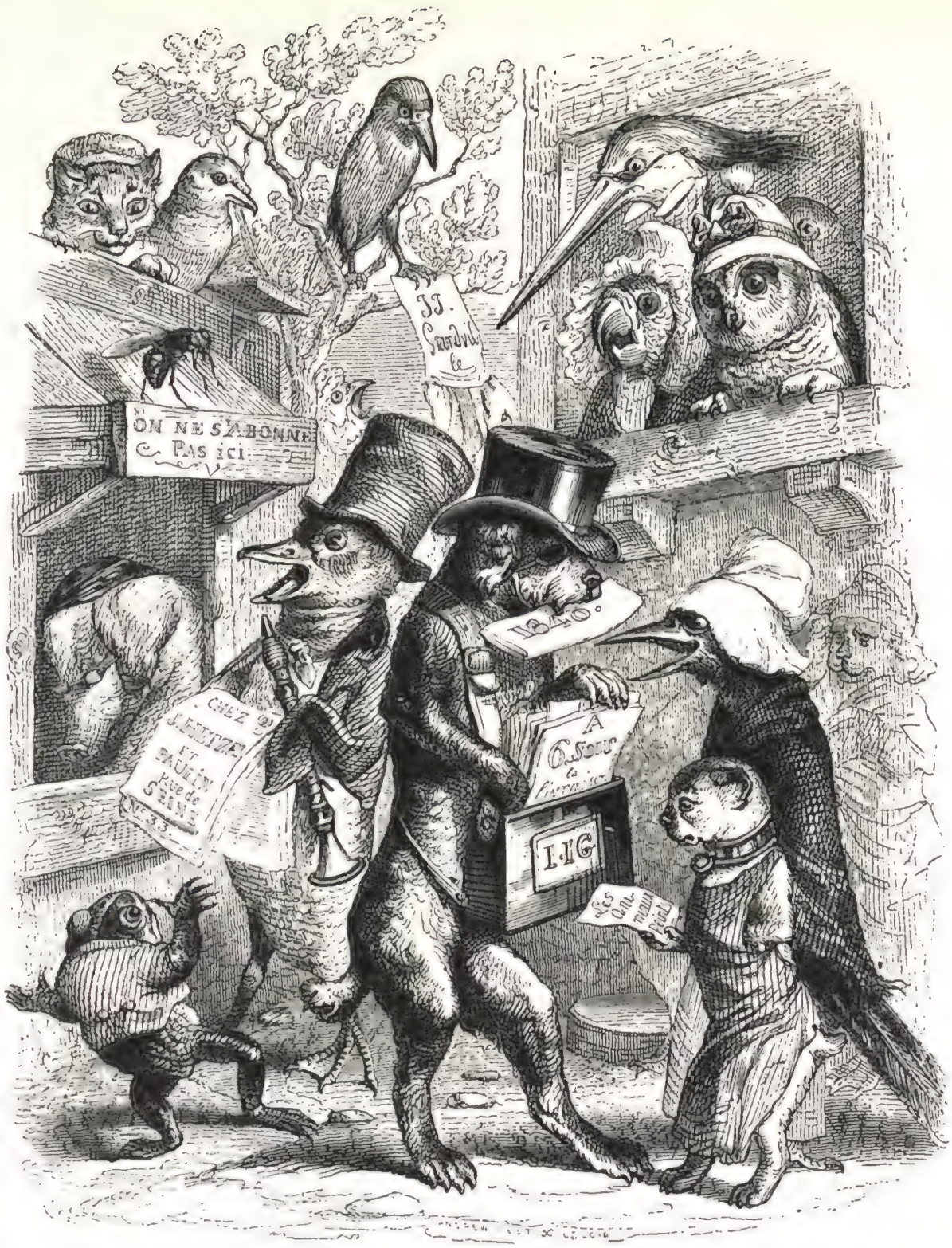

Street hawkers offer first installment of animals' book. Various labels announce artist's name, publishers' names and addresses, date and price.

look of terror fires the dog patient's eye. After all, he had entered the hospital with only a broken paw.

The famous French social philosopher Charles Fourier (1772-1837) was also an idealist dedicated to communal living as a solution to the privations of urban and rural poverty. In England and America, Robert Owen founded Utopian communities in response to the raw side of the industrial revolution. Grandville thought such plans harebrained. Calling his society Happy Island, he shows the children (p. 138) being raised by weasels and snakes—and being fed *lait mitigé*, watered-down milk.

This kind of satire, however, does not mean Grandville was blind to social problems. Poverty and human suffering seem to be the driving vision behind much of his work. For example, there is only one fully human figure in *Les Animaux:* an indigent wanderer in rags and straw-stuffed wooden shoes, who serves to illustrate a rabbit's amazed discovery—"There are men who walk as beggars over the fertile earth."

In 1844, Grandville's most famous work, *Un Autre Monde*, appeared. Its success was probably the result of its being entirely dependent on Grandville's pencil. The book is, according to the introduction of a facsimile, "the best anthology of his work." The text unites

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what at first seem simply wildly disparate and magnificently phantasmagoric drawings. Basically, the book details the excursions of three travelers who explore the modern world from three points of view: from under the seas, from the sky (by balloon), and from new rovings about the land.

Here is indeed another world, where fish go fishing for swimming humans (p. 133). Their bait: jewelry, champagne, money, gold metals and high-fashion accessories. Elsewhere, a dog walks his man (p. 135). While the fashionable stay at home, their place in the public eye is occupied by their walking sticks, hats, boots and gloves.

The world of art is also subject to Grandville's saturation bombing. A ballerina is seen as a marionette, or becomes a spinning top, then a spool. Great literature is ground off a roller at the publisher's shop fresh from the author's pen —marketed and sold in chunks like so much pork sausage.

Un Autre Monde also has the Society Islands, where social class is determined by height: aristocrats are thin, elongated freaks, and tradesman and servants are dwarfs. After all, if society is to be arbitrarily divided along class lines, what better way can there be to assign castes? Can a short man fake being tall? Of course he might try. But Grandville knows that social theorists are at work. They have devised an enormous press to level society. Grandville's joke is that the press requires a laughably small weight to squash the upper classes down to regulation size.

In Grandville's Utopian community, Happy Island, none is happy, least of all the children, who are fed watered milk by predator-nursemaids.

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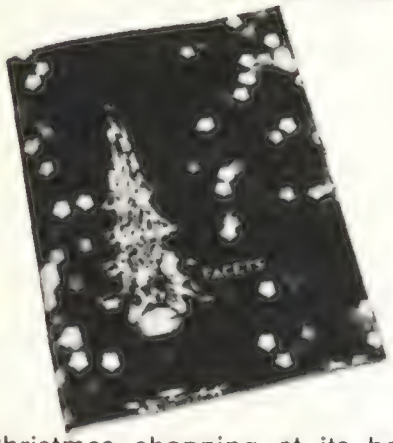

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In spite of such serious underpinnings, however, Grandville's work is not overly didactic. He offered the world no sure-fire solutions, no panaceas. His aim was simply to show what he saw. He never succumbed to the dreaded 19th-century malaise: taking oneself too seriously. Grandville tried to dream and giggle his way to immortality. And his best work is the product of such dreams—the vegetables and umbrellas that he animated; his impossible animals, snail-moths, boa-bears; the rings around Saturn that serve as a balcony; his vision of the afterlife, where history's greatest conquerors compete for a carousel's brass ring.

Grandville's influence spread far. Lewis Carroll and his illustrator, John Tenniel (see SMITHSONIAN, December 1977), may have taken an idea from Grandville for the battle of the playing cards and the mock turtle, whose calf's head and tears are very close to Grandville. Similar attributions might be made for Don Marquis' archy and mehitabel and the entire output of the Walt Disney studios. Indeed, the surrealist movement itself seems to flow from the basic impulses of Grandville's art: to record dreams, to preserve minute details—in short, to turn apparitions into art.

Jean-Ignace-Isidore Gérard, known as Grandville, died late in the afternoon twilight of March 17, 1847. Spent alone in a sanitarium near Paris, his last hours were filled with the fantastic visions that had been his life's stock-in-trade, only this time they were brought about by a raging infection. We can hope that those last dreams were a comfort to him but we cannot know. This time he was his own, and only, audience.

This may represent Grandville's dream of medicine at work (see paragraph above), with the doctors and students seen as loathsome species of animals.

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KODAK CAROUSEL PROJECTORS

By Marion Steinmann

Fossil hunters find ancient treasures around Manhattan

Gleaming 'marble' in building lobbies may really be slices of an old reef, peppered with extinct sea creatures

Matthew Ahrens, 7, examines a fossil in wall of Associated Press Building in New York. Behind him is Sidney Horenstein, urban fossil-hunt leader.

In midtown Manhattan there is a place where fossils of an ancient cephalopod lie exposed in the polished surface of a rosy-red rockface. These spiral shells once housed long-extinct cousins of the chambered nautilus, and they are right out in the open. Yet every day thousands of busy people scurry past, oblivious to these vestiges of a time when no mammal walked the Earth.

These fossil shells lie embedded in the red stone slabs that line the lobby walls of the Tishman Building, an aluminum-clad skyscraper at 666 Fifth Avenue (p. 144). Many common building stones contain fossils, explains Sidney Horenstein, an invertebrate paleontologist at New York's American Museum of Natural History. Horenstein, who also teaches geology at Hunter College, tracks down fossiliferous rocks to be seen on city streets and leads fossil-hunting field trips through the city's canyons.

On an urban fossil hunt, true, you don't find any dinosaurs and you can't take samples home for your collection. But city field trips do have a special quality all their own. Passersby give you puzzled looks, bank guards are apt to ask what you are doing, and once the police were so disconcerted by a Horenstein fossil hunt that they radioed his name to the station house for a check.

For sheer variety of fossils, the city can't be beat. In one stroll around midtown Manhattan, you can see specimens from several continents and from all over the United States. These fossils are not only handsome in themselves, but with Horenstein as a guide they offer glimpses back into the Earth's history—when our ever-restless continents were in different locations and warm seas inundated places that are now dry land.

As a native New Yorker, Horenstein has long been fascinated by the wealth of natural wonders to be found within the city's confines. He can show you Indian caves in Manhattan, and he knows where a mastodon skeleton, left over from the Ice Age, is buried beneath an apartment house. In researching Manhattan's fossil-bearing rocks, Horenstein finds himself on ground generally unfamiliar to paleontologists—reading architectural magazines, talking to building owners and marble suppliers, learning the special terminology of the construction industry. The building trade uses the word "marble" for many rocks that to a geologist are just plain old limestone, and the fancy name in a marble catalog may have no relation to a stone's origin: "French gray marble," Horenstein has learned, is actually a

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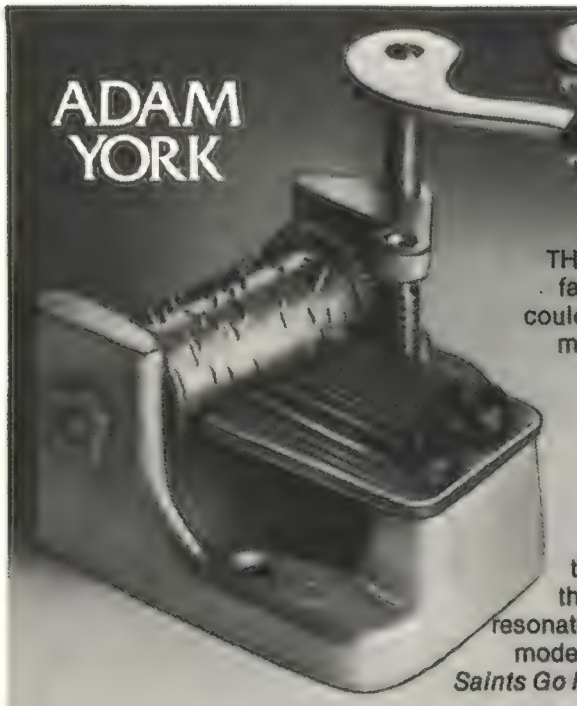

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Cephalopod fossils can be discerned in limestone lobby of Tishman Building.

limestone from northern Vermont. He worked up his city fossil hunt recently for the New York Paleontological Society, a club of some 200 amateur fossil enthusiasts (see Additional reading list). He seems to have struck a mother lode of interest among New Yorkers: when the Paleontological Society announced a midtown fossil hunt for the public recently, more than 300 people appeared.

A typical Fifth Avenue fossil hunt starts in the lobby of the Tishman Building, where Horenstein has thoughtfully explained to the guard what is going on. A fossil, he tells his party, is a trace of life preserved in rock, whether a footprint or a cast, a stone replica of the original organism or the actual creature itself. Generally it is sedimentary rock (sediment that has been compacted and consolidated over time) that contains fossils, Horenstein explains, particularly limestone which usually is formed from accumulations of shells and other remains of once-living creatures.

The rich red fossil-bearing limestone in the Tishman inner lobby is known in the building trade as "French rouge antique," Horenstein tells us, and can also be seen at the Museum of Modern Art, at the elevators. It comes from quarries in France's Massif Central, east of Toulouse, where it was laid down some 360 million years ago at the bottom

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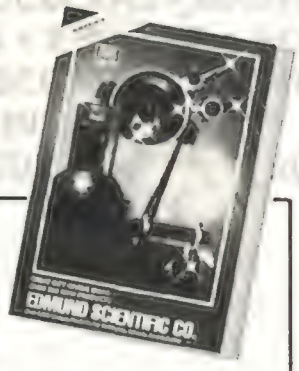

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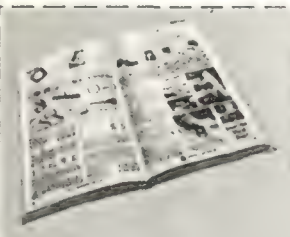

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of the deep ancestral Mediterranean Sea. The land then was cloaked with the first primitive forests but there were as yet no flowers, mammals, birds or dinosaurs (or other reptiles), and insects were just evolving. The first air-breathing amphibians were only just beginning to climb out of the water and live on land. In the seas, there were many fish, but generally life on Earth was dominated by the invertebrates, creatures without backbones.

One of the most successful of these was a cousin of the chambered nautilus, with its coiled shells embedded in the Tishman red limestone. The fact that these shells are partitioned internally into chambers shows that they are not snails but belong instead to the cephalopods, a class of tentacled creatures whose living members include the squids, octopuses, cuttlefish and the few extant chambered nautiluses. These shells are ammonoids, a now-extinct order that branched off from the nautilus line early in the course of evolution. Free-swimming carnivores, the ammonoids flourished all over the world for more than 300 million years—far longer than the dinosaurs—and then died out at the same time the dinosaurs did, as suddenly and as mysteriously.

Each white blotch in RCA Building wall is a fossil some 475 million years old.

Clam and snail remains can be seen in the limestone balcony of a Bun N' Burger.

Two blocks south in Rockefeller Center, Horenstein proceeds into the cavernous lobby of the RCA Building and shines a flashlight on the dark walls. We are looking at a near-black stone, heavily mottled with white—a limestone, he explains, cross sections of a reef built up in a shallow tropical sea that covered what is now northern Vermont some 475 million years ago (p. 146). Variously known in the construction trade as "French gray marble," or "radio black" or "Champlain black," this stone comes from quarries on Isle La Motte in Lake Champlain. It can also be seen at the Metropolitan Museum of Art, in the National Gallery of Art in Washington and in the Borg-Warner Building in Chicago.

Each and every white blotch in this stone, Horenstein explains, is a fossil. At the time the rock was formed, the land was still virtually naked. Even the plants had not yet emerged from the water. In the seas there were but few fish, and while corals existed, they had not yet evolved into important reef builders. This RCA reef was instead constructed by sponges. Yet the reef teemed with a diversity of invertebrate denizens, preserved here on the block-long lobby walls. Horenstein shows us straight, tapered nautilus shells; bryozoans, small colonial creatures that build bushlike structures; brachiopods or lamp shells, clamlike

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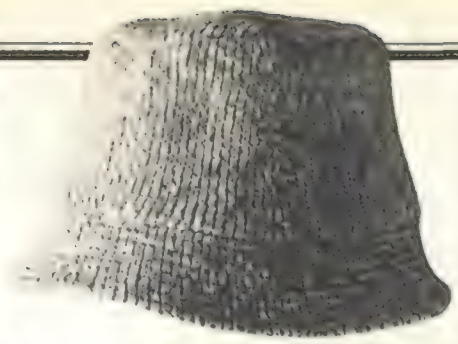

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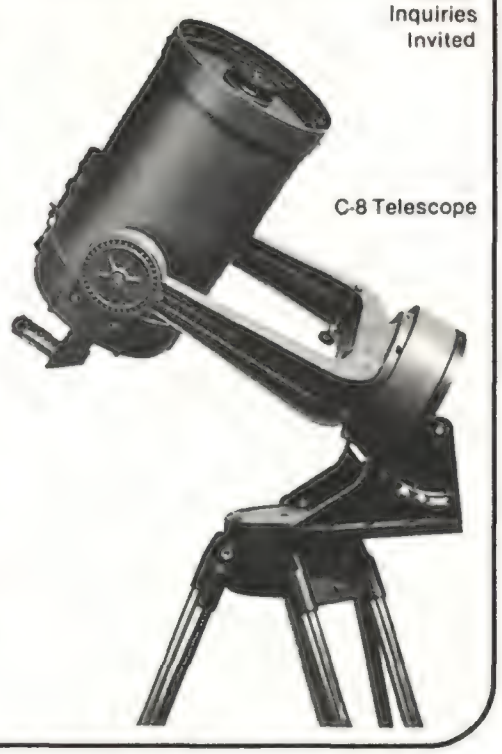

C-8 Telescope

bivalves that live on the sea bottom. By the NBC logo at the center of the lobby, he points out an assortment of sea lily stems, and by the entrance to Manufacturers Hanover bank, a nice selection of giant snails, so-called because the shells can be eight inches across.

Outdoors again, we dodge across Fifth Avenue. Horenstein pauses by the entrance to Saks Fifth Avenue and pulls out his magnifying glass. The yellowish stone framing the doorways and display windows, he explains, are slices through another fossilized tropical reef. This one is much more recent than the RCA reef, however; it is 360 million years old, about the same age as the Tishman ammonoids—by this time corals had supplanted the sponges as reef builders.

When Horenstein first spotted this Saks reef, his practiced paleontologist's eye could see that the corals were typically Devonian, which meant that the rock was somewhere between 395 and 345 million years old. But how to narrow down its age within this 50-million-year time span? And find out the name of the rock and where it came from? The store's public relations people did not know.

At the New York Public Library, Horenstein started by looking through architectural and construction trade magazines for the year 1924, hoping that articles about the then-new Saks building would mention the name of this stone. They didn't. But the *New York Times* had seen fit to print the news that the trim around the doors and display windows was made of "Ste. Genevieve golden vein marble" from Missouri.

Now Horenstein could go to the scientific literature. On a geologic map of Missouri, he spotted all the counties where Devonian age rocks are found. Then he went to the geologic reports that describe each county's mineral industries. From these he learned that the Saks stone was quarried near Ozora, Missouri, in Ste. Genevieve County, some 50 miles south of St. Louis, from a rock formation laid down in a shallow tropical sea about 360 million years ago.

After all this trouble, Horenstein subsequently realized that this same Ste. Genevieve limestone also decorates a far wing of the rambling American Museum

A free-lance writer dealing with science and medicine, the author just finished a book, Island Life, *for Time-Life Films.*

Tiffany's jeweled timepieces contrast with fossilized sea lilies in the wall.

of Natural History itself. It can also be seen in the Fisher Building in Detroit, the Security Building in Denver and police headquarters in Los Angeles.

We walk back across Fifth Avenue and along West 48th Street, where Horenstein ducks into a Bun N' Burger restaurant. He has led so many field trips in here that he and the cashier recognize each other. On the balcony over her head is a beige limestone strikingly patterned with deep pits left by two different kinds of shells: an elegantly fluted clam and a smaller, screw-shaped snail (p. 147). Together these two mollusks built up a shell bank, 120-odd million years ago, near what is now Austin, Texas, in the midst of a vast sea that stretched from the Gulf of Mexico nearly to the Arctic. By this time in the Earth's history, there were flowering plants and a few early birds and primitive mammals around, but generally life on Earth was dominated by the reptiles.

"I go up and down the steps under this balcony every day," confesses the Bun N' Burger supervisor, "and I really thought it was artificially patterned until Mr. Horenstein came in."

Farther up Fifth Avenue, Horenstein points out that the diamonds glittering in Tiffany's small, exquisite display windows are also framed by fossils (above)—

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Limestone base of Cleopatra's Needle in Central Park is "solid fossil."

of sea lilies or crinoids. These are ancient animals—relatives of the starfish and feather stars (SMITHSONIAN, May 1978)—that looked like plants. And here, nestled among the billows and swirls of limestone at Tiffany's, we can see both cross sections of their stalks—round white circles with black dots at the center—and also lengthwise pieces.

Up in Central Park, we climb a grassy knoll to Cleopatra's Needle, a 3,500-year-old Egyptian obelisk (which actually had nothing whatsoever to do with Cleopatra) brought to New York in 1881. The obelisk itself is made of a granite containing no fossils, but the base on which it stands is a coarse, bright white limestone (above). This is one of the stones, quarried in the hills outside Cairo, that the Egyptians used in the construction of the great pyramids at Giza and also for much of the present-day city of Cairo. As rocks go, this limestone is a mere youngster, only 45 million years old. It was formed from sediments at the bottom of the Mediterranean Sea, at a time when a relatively modern fauna had evolved: the dinosaurs had gone, there were many birds in the air, and our fellow mammals dominated the Earth.

This stone, Horenstein shows us, is "solid fossil, solid fossil." It is entirely

made up of disk-shaped shells, an inch or two in diameter, secreted by an energetic protozoan called *Nummulites.* "They were incredible creatures," says Horenstein. "It is amazing that one little one-celled guy constructed a shell like that." When modern paleontologists came to give this prodigious protozoan its scientific name, they recognized it as the true builder, in a sense, of the pyramids and called it: *Nummulites gizehensis.*

Perhaps the richest fossil lode in town, however, is back downtown in Rockefeller Center. The inconspicuous, buff-colored stone that sheathes most of the Rockefeller Center buildings is a limestone from Indiana. It also covers the Empire State Building, the Waldorf-Astoria, the Metropolitan Museum of Art and many of the elegant apartment houses on upper Fifth and Park Avenues. Walk past these buildings and this Indiana limestone looks uniform and cementlike. But step up close, nose to stone, and you can see that this rock, too, is solid fossil, composed entirely of tiny shells, some whole, many broken into bits and pieces: corals, snails, sea lilies, protozoans, clams, lamp shells, bryozoans, literally hundreds of different species. These shells were washed out onto great underwater banks, 330 million years ago, in a sea that then covered much of the Midwest. And now the fossil remains of these countless trillions of humble sea creatures have unwittingly achieved a grander monument than is granted to most of us supposedly cleverer Homo sapiens, who, for the present at least, dominate this planet.

Woman passerby keeps close eye on Horenstein as he checks for fossils.

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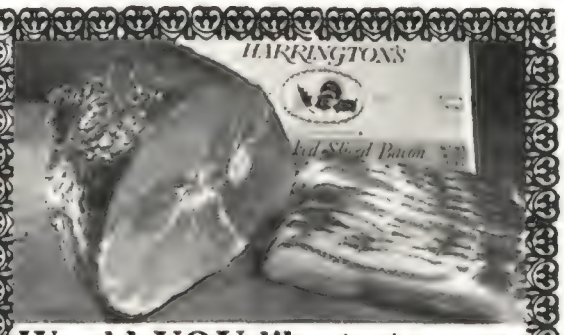

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Book reviews

Chateaubriand: The Longed-for Tempests (1768-93)
George D. Painter
(Alfred A. Knopf, $15)

François-Auguste René, vicomte de Chateaubriand—author, diplomat and namesake of a beef delicacy invented by his chef—rose to be French minister of foreign affairs under the Bourbon restoration and a motive force of the 19th-century romantic movement in literature. Now, at long last, he has a biographer, a masterful one.

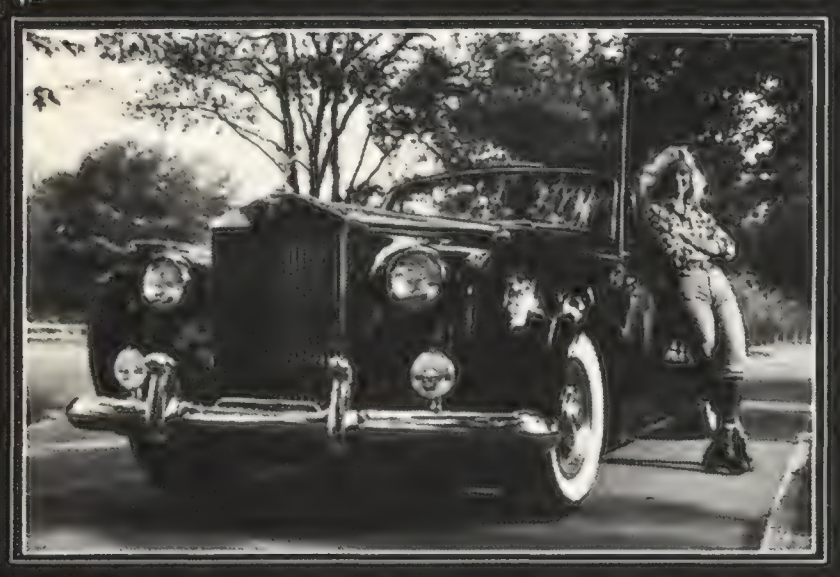
Since 1801, when his American Indian tale *Atala* was published, Chateaubriand's works have been reprinted and translated; critical literature about them and their author has compounded. George D. Painter fully utilizes these and other sources in *Chateaubriand: The Longed-for Tempests (1768-93)*. To this work on one of the first modern French romantics, he brings the experience of dealing artfully with Marcel Proust, another French literary genius known for his excessive egotism. Thus this first of a projected three-volume life of Chateaubriand far surpasses the usual literary biography.

To achieve a veritable re-creation of Chateaubriand and his times, Painter places the infant subject in a carefully reconstructed Breton milieu among the vivid personalities of his formative years, then leads him through the perils of the early French Revolution to safety in exile. Reminiscences of the aged Chateaubriand, taken from *Mémoires d'outre-tombe* and his other writings, along with contemporary documents and an unusually keen understanding of the French psyche, help the author flesh out the emerging writer-diplomat. The resulting volume is highly readable, woven tight by sound historical research and adroit use of romantic imagery.

Irritating as florid immensities of style may be for a 20th-century reader, Painter renders them palatable, for they are essential to his subject. He is ever in complete control of his narrative and his language, which sometimes teeters on the brink of clichés, only to delight by swerving away into "the blank of night."

Melancholy of ageless Breton landscapes, wafting sylphides and the foaming infinity of ocean are building blocks for an omniscient biographer who, with dashes of prefiguration, brings the author of *Atala* into focus against a background of a beleagured Celtic nobility—descendants of that romantic race which shaped the personality of Brittany.

Because the literary Chateaubriand is complemented by the adventurer-diplomat, the historical framework for *The Longed-for Tempests* is especially impor-



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tant. Painter excels in dealing with the ironies of history—such as the separate visits of Maret, Barère and Chateaubriand to the Rousseau memorial on the day in June 1792 when Parisian mobs first invaded the Tuileries. His descriptions of the gathering revolution, the local, regional and national changes in the French power structure, and life in the abortive Army of the Princes highlight the drama of events during the tumultuous last quarter of the 18th century.

Unlike some contemporary biographers, Painter invites the reader's perusal of his sources through bibliography and footnotes as well as the appendix of literary references. Indeed, he exposes his research as completely as he does the subject of his work. In face of a plethora of expert literature discounting large portions of Chateaubriand's travels in America, he daringly and painstakingly reconstructs the journey to support an almost literal interpretation of the route followed from Baltimore to Niagara, down the Ohio and back to Philadelphia. He includes an analysis of existing 18th- and early 19th-century maps and travel accounts influential in Chateaubriand's works. Motivation for the journey involves one of the most poignant relationships described in the volume—the association between the aging Malesherbes of the ancien régime and the uncertain, adventure-driven young Chateaubriand.

Mrs. Trollope was dazzled by Chateaubriand's "grace, wit, and manners."

A similar sensitivity characterizes Painter's delineation of many of Chateaubriand's family and friends. Their integration into the fabric of his life is a most convincing part of the biographer's

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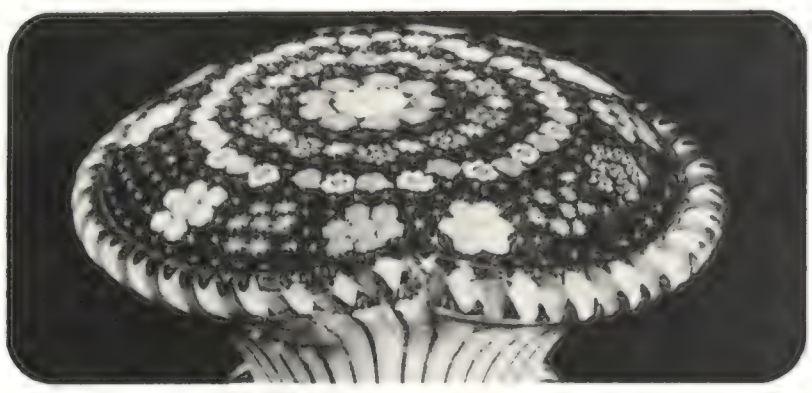

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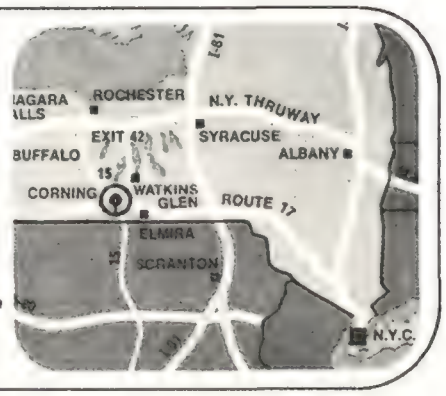

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craft. Beside his relationship with his sister Lucile and his pursuit of the elusive Sylphide are juxtaposed the realities of events in France and even the trivia of daily life. The result of such art in a moving narrative is a book which should appeal equally to historians, literary devotees and a larger reading public. One yearns for volumes two and three.
—Betty-Bright P. Low
Historian of Franco-American culture

The Life, Manners, and Travels of Fanny Trollope: A Biography
Johanna Johnston
(Hawthorn Books, $10.95)

More often than not, Frances Trollope is characterized as the mother of novelist Anthony Trollope. In fact, she was not a very motherly mother. Anthony felt ambiguous about their relationship all his life; Mrs. Trollope never noticed. She was too busy changing from the charming, clever Fanny Milton, daughter of a country vicar, into the charming, clever Mrs. Trollope, coping with a barrister husband who was pompous, pedantic, tactless, miserly and later morose to the point of insanity. She gave birth to seven children as though it were nothing more than trimming a bonnet. She tried valiantly to make ends meet after her husband's maladroitness and her own extravagant housekeeping and entertaining had sent them into bankruptcy and caused their sons the humiliation of being charity students at Harrow.

Mrs. Trollope's pecuniary solution made her famous overnight at the age of 52: having gone to seek her family's fortune in America for some three years (with disastrous results), she wrote *Domestic Manners of the Americans* and brought the manuscript back to England in 1831. Published the following year, it was "the book of the season." She turned professional and produced 40 works (in 111 volumes) in the next quarter-century.

Johanna Johnston describes this independent woman in an intelligent and sympathetic biography. A vivacious bluestocking, Fanny Trollope knew many of the most interesting and often revolutionary figures of her age. The famed French writer Chateaubriand (see preceding review) attended one Paris salon reading "especially for the benefit of Mrs. Trollope and her daughters." She was politically liberal and personally caustic,

much given to that favorite Regency pastime, "quizzing," which meant teasing and having the last witty word.

Through trouble, loss and sorrow (she outlived most of her family and survived a variety of financial mishaps), Fanny Trollope was always resourceful and resilient. Her ability to bounce back seems to have come in part from her father, an eccentric in the great English tradition who spent his life producing weird inventions to make the world *"au mieux,"* and in part from a formidable talent for repression. Her need to keep up appearances was very strong, but Johanna Johnston penetrates far enough to show the tensions in English society and family life of the time, to uncover the neuroses under a stolid exterior of roast beef and Yorkshire pudding, prodigious learning and unbending traditions.

Fanny Trollope's resilience created her *Domestic Manners of the Americans.* After leaving Tennessee and Nashoba—radical Frances Wright's mismanaged experimental community for slaves—Mrs. Trollope set up shop, quite literally, in Cincinnati. She built her famous bazaar (also known as Trollope's Folly) there, a fanciful structure not unlike George IV's outlandish Brighton pavilion, and engaged in an unsuccessful attempt to bring her civilization and culture to the Americans. There, too, she started her "almost compulsive" note taking, feeling that otherwise no one back home would believe her experiences. This grew into her book, an indictment of American crudeness, hypocrisy and narrow-mindedness.

Ironically, in England her book was enlisted in the Tory cause to counter agitation to reform Parliament along more democratic lines. "Yankee talk" also became a conversational fad. In America her racy genre pictures won her the dubious honor of being hated, vilified and turned into a folk character. Her book was dubbed "lies of an English lady" and influenced the language there—"to Trollope" was to spit, and a tourist of redoubtable and unstoppable energy was "a very Trollope."

Fanny Trollope's travels were both real and imaginary—in her many novels she created fictional situations concerned with slavery, child labor, the excesses of religious emotionalism. It is a pity, indeed, that her biographer doesn't follow these journeys in more detail. Although Mrs. Trollope ended up in Florence,

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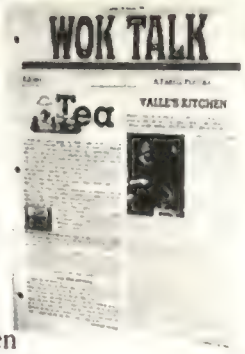

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comfortably established in a beautiful palazzo and firmly entrenched in the expatriate intellectual social life there, she is best remembered as a tiny woman bustling hurriedly from one adventure to another, whether domestic or exotic. To her, manners were both mores and rules of social conduct. Her lifetime of studying them left a guidebook to a complex and captivating era.

—Celia Betsky
Free-lance critic, Smithsonian Fellow

Mencken: A Study of His Thought
Charles A. Fecher
(Alfred A. Knopf, $15)

For many, including a generation for whom H. L. Mencken is little more than a name in American letters, Charles A. Fecher's book will constitute an invitation to read some of the best satiric writing our country has produced. This is so even if Fecher, whose study of Mencken is at once readable, entertaining and masterful, issues his invitation for the wrong reasons.

Cigar-chomping Mencken, for all of his learning and wide-ranging interests, had no body of "thought." He was a working newspaperman who observed and commented on America's foibles and insisted on a series of sharp prejudices. At the age of 59, looking back on a career with Baltimore's Sunpapers, *The Smart Set* and *The American Mercury*—a career which by the mid-1920s had made him a

critic of national reputation—Mencken could write, "On all known subjects, ranging from aviation to xylophone-playing, I have fixed and invariable ideas. They have not changed since I was four or five years [old]."

Mencken insisted that most men were "goose-stepping ignoramuses and poltroons." As Fecher shows, several factors helped form this view: Mencken's high-principled German ancestors (many of them PhDs); his youth in turn-of-the-century Baltimore, a proud and smug city where Victorian morality dominated middle-class life; and his reading of James Gibbons Huneker, George Bernard Shaw, Nietzsche and Thomas Henry Huxley, all of whom influenced him.

Mencken's father divided men into those who paid their bills and those who did not; Mencken divided them into the "intelligent minority" and the "booboisie," the latter category comprising about 95 percent of the population. As Fecher observes, "The mere fact that everybody else believed something was, for him, sufficient evidence that it was not true." By this standard, he was against many things, including psychology ("the Freudian rumble-bumble"), faith ("an illogical belief in the occurrence of the improbable"), politicians ("The average democratic politician, of whatever party, is a scoundrel and a swine") and, most of all, Puritanism ("the haunting fear that someone, somewhere, may be happy"). In countless articles and reviews, and in about two dozen books, Mencken hurled metaphors and similes with consummate skill, exaggerated and oversimplified to make his points.

Was he a condescending snob? No, Fecher argues, but not all that convincingly. Mencken believed that neither money nor learning made the man (indeed, he reserved a special wrath for English professors), but rather that competence did. "The only sort of man who is really worth hell room [is] the man who practices some useful trade in a competent manner, makes a decent living at it, pays his own way, and asks only to be left alone."

Fecher explains how Mencken's own values led him to make his frequent attacks on sham, fraud and hypocrisy in American life. Mencken's assaults made him the most famous newspaperman and magazine editor of his time—and "the most hated." When asked why he con-

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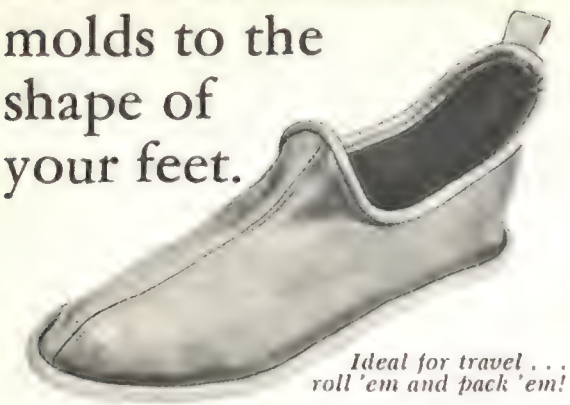

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tinued to live in the United States ("a commonwealth of third-rate men"), he replied: "Why do people visit zoos?"

Despite Fecher's attempt to categorize him as such, Mencken does not come off as a philosopher or theorist; he was an old police reporter who had seen it all and was unafraid to call the shots. With his extraordinary command of language, he could deliver common sense (more often than not) like a lightning bolt. Fecher's book is a wonderful excursion through an irresistibly funny landscape of "mountebanks," "brummagem" and "palpable idiots" that is now a unique part of Americana.

—Joseph Barbato
Free-lance writer and critic

The Magic World of Orson Welles
James Naremore
(Oxford University Press, $15.95)

More dramatic than many of his films is the life Orson Welles has lived. By age 26, as James Naremore points out, he "had achieved a success in show business unlikely to be repeated by anyone," rising to hallucinatory pinnacles in both theater and radio before going to Hollywood with carte blanche and making what is still considered the premier American sound film, *Citizen Kane.*

As radio's Lamont Cranston in the popular mystery program *The Shadow,* Welles' resonant voice was familiar to millions in the late 1930s. His dramatization of *War of the Worlds* on Halloween eve 1938 created mass panic in listeners convinced that the nation was being invaded by Martians. This program, Naremore tells us, catapulted "Welles to international fame . . . linking his name forever to the greatest hoax (however unintentional it may have been) in the history of broadcasting."

Then, as dramatically as it had prospered, Welles' career fell apart, until today at age 63 he is prone to refer to himself as "just a poor slob trying to make movies." Critic Andrew Sarris has called him "the aging enfant terrible of the American cinema . . . a young man from Wisconsin who acted out his Faustian fantasies on the screen until they consumed him." And Welles has noted, with more than passing bitterness, "During the twenty years that I worked in or was associated with Hollywood, only eight times did they permit me to utilize

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the tools of my trade. Only once was my own final cut of a film the one that premiered, and . . . only twice was I allowed to give my opinion in the selection of my subject matter."

One of Naremore's key points is that Welles' work has a more than passing affinity for Gothic fiction—his films largely have been about "tyrannical egotists, men who try to imitate God," tyrants who end up being "more fascinating and sympathetic than the naive, commonplace figures around them."

It was, unfortunately, Welles' fate, as well as that of his characters, to be hounded out of his seat of power by men he considered commonplace. *Citizen Kane,* for all its greatness, proved to be, Naremore feels, "a fundamentally dangerous project" that succeeded only in making Welles suspect in Hollywood, leading the studio moguls effectively to end his influence in the industry for good.

Once cast aside, Naremore says, Welles and his films, no matter how intriguing, reflect this outsider status. His subsequent American productions, ranging from *The Lady from Shanghai* to *Touch of Evil,* were affected by "his alienation from the movie colony and society at large . . . his growing dissatisfaction with American life," while the still later made-in-exile European films like *The Trial* and *The Immortal Story,* undoubted testaments to his ingenuity though they are, indicated that "Outside America, Welles quite simply lost the roots of his art, his work growing more introspective and generalized . . . the manic satire and punch of the Hollywood films was lost."

Though Naremore's ideas are intriguing when presented in summary form, this is unfortunately the best way to receive them. His book, written in a heavy, academic style wherein every sprocket hole is deemed worthy of analysis, tends to wear thin.

The major feeling one draws from this book is that the word "magic" in the title should be changed to "tragic." Here is a master, a director who had "the potential of bringing so much imagination to an inert studio technology," ending up shuffling around the borders of cinema—"a cultural legend who, more than ever, exploits the ironies of his own celebrity." A sad end for a man whose beginning was legendary.

—*Kenneth Turan,* free-lance writer
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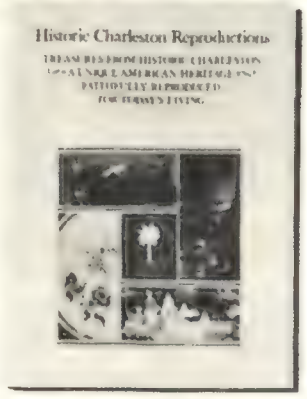

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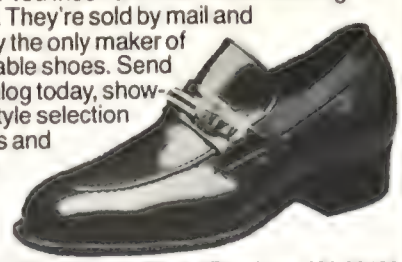

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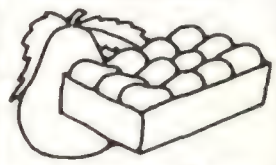	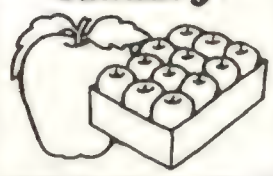		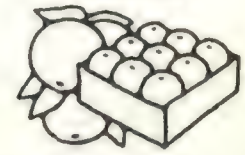
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		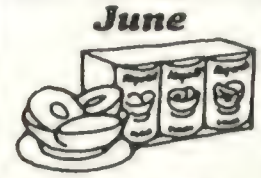	
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	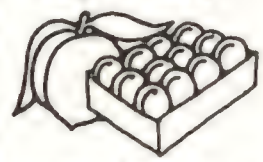		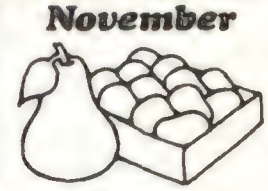
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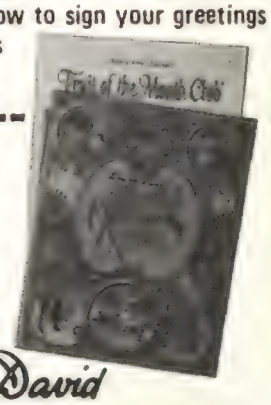

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For both the seasoned and would-be traveler, the Smithsonian has developed a travel program to meet a variety of tastes and budgets. In order to accommodate the increasing growth and interests of Smithsonian Associates, the tour programs have expanded, bringing travelers to places reflecting the Institution's interests.

Three types of trips are available, Charter, Domestic and Study, each with its distinct character. Foreign Study Tours provide small groups with culturally oriented, specialized trips, under the guidance of museum curators or experts in respective fields. Foreign Charter Tours, consisting of several small groups under the leadership of skilled guides and interpreters, are lower in cost, combine study, discovery and vacation. Domestic Tours offer specialized guidance and expertise generally unavailable to persons traveling on their own.

Foreign Charter Tours

Japan—November 5-21: The heart of historic Japan with an extended program in Kyoto and Nara followed by choice of travel seminars to the Inland Sea, the Sea of Japan or Kyushu. Conclude in Tokyo with visits to Nikko or Kamakura. Visit ancient temples, castles and shrines with expert study leaders. (Originates and ends in San Francisco.)

Winter Russia*—December 28-January 11: Includes the historic and diverse cities of Leningrad, Tallinn and Moscow plus optional two-day excursion to Vladimir and Suzdal; attend special winter festivities including gala New Year's Eve party and a traditional troika ride; view the treasures and palaces of Czarist Russia; life-seeing visits to schools, factories or clinics; attend the Russian theater and the circus.

Mayan Mexico: The Yucatán Peninsula—January 4-16 or January 28-February 9: A complete tour of the extraordinary Mayan ruins of Yucatán. Accompanied by an archaeologist, visit the sites of Chichén Itzá, Palenque, Uxmal, Tulum, plus the seldom-visited sites of Edzna, Kohunlich, Río Bec and Cobá. Also includes a brief pause at Akumal on the Caribbean Sea. An adventure tour. (Originates and ends in Mérida.)

Guatemala—January 17-28 or February 14-25: In the company of an archaeologist, visit Tikal, the monumental Mayan city of the Petén jungle; Copán, a Mayan site deep in the mountains of Honduras; plus the Mayan ruins of Quiriguá, El Baúl and La Democracia. Travel to the Guatemalan highlands to visit Lake Atitlán and Antigua—the Spanish colonial capital preserved in its 17th- and 18th-century splendor. Also visit Chichicastenango with its ancient market and Indian rituals. (Originates and ends in Guatemala City.)

Kenya, East Africa*—February 1-18: Wildlife and tribal life adventure providing modern African insight—and the "Africa that used to be," in the old safari tradition. Seminars in Nairobi and in the field—Masai Mara; Samburu; Kilaguni.

New Zealand and Fiji—February 21-March 11: This exciting tour includes Mt. Cook, Te Anau and Milford Sound, plus Auckland, Rotorua, Wellington and Christchurch. Included will be talks on New Zealand's natural history, Maori heritage, parliament, plus a home visit. Brief rest stop at Fiji before return. (Originates and ends in Los Angeles.)

Springtime in Greece*—April 29-May 15: A program in Athens and a cruise to Hydra and Aegina are followed by visits to the renowned sites of ancient civilizations when the countryside is a paradise of wild flowers. A mainland tour to the Peloponnesos, Epirus, Thessaly, the Pelion peninsula and the awe-inspiring country around Delphi, highlights the rugged mountains and the amazingly rich array of wild flora.

Russia*—May 20-June 3: Leningrad, Tallinn, and Moscow; see the Hermitage and Tretyakov Museums, the palaces of Pushkin or Petrodvorets, the ancient Kremlin with its old churches and Armory Museum; life-seeing visits to schools, factories or clinics; attend the best of Russian theater and circus.

Low cost of tours includes first-class hotels, most meals, sightseeing, lectures, theater tickets and air fare. *Optional predeparture course will be available.

Write Smithsonian Associates Travel Program, A&I 1278, Smithsonian Institution, Washington, D.C. 20560 or call (202) 381-5635 for brochures on specific tours.

Domestic Study Tours

Toronto—September 19-25: Special program of museum lectures and walking tours to experience the exciting diversity of this city's art and architecture. Also visit Stratford Shakespeare Festival and Niagara Falls.

Weekend at the Hirshhorn Museum and Sculpture Garden—September 22-24: A weekend devoted to the Hirshhorn's exemplary collection of 20th-century painting and sculpture, with films and discussions.

Desolation and Gray Canyons—September 29-October 9 or October 10-20: White-water trip for the adventurous; explore the geology, wildlife and exciting Indian and outlaw history of Utah's Green River.

California Wine Country—October 1-7: From San Francisco, visit selected vineyards in Napa, Sonoma, Santa Clara and Monterey with wine tasting and special lectures and discussions by vineyard owners and wine masters.

Illinois Archaeology—October 14-21: Join archaeologists in the excavation of an Illinois River valley site spanning almost 10,000 years. Actual digging will be supplemented by instruction, lectures, laboratory work and field trips.

Colonial Williamsburg—October 25-29: This program for adults, with accommodations at the renowned Williamsburg Inn, will examine life in the 18th century, with special tours and programs on the architecture, gardens and archaeology of the Colonial city.

Christmas at the Smithsonian—December 8-10: Seventh annual Christmas weekend with traditional tree-trimming party and special behind-the-scenes tours.

Virgin Islands Adventure—January 5-14: Explore the British Virgin Islands by chartered sailboat to learn about the spectacular life of the coral reef.

Yosemite in Winter—January 26-February 4: Absorb the splendor of Yosemite in winter, while learning about this unique park under the guidance of Yosemite Institute staff. The program will include cross-country skiing and evening lectures on a variety of subjects such as forest ecology, glaciology, astronomy and wildlife.

Baja Whale Watch—February 9-17 or February 17-25: Observe gray whales and marine life from San Diego to San Ignacio Lagoon, aboard a chartered sport-fishing boat. Study natural history of Baja coast and islands.

Washington "Anytime" Weekend: Choose any weekend to visit the nation's capital and enjoy a special tour of the original Smithsonian building, spend two nights at Loew's L'Enfant Plaza Hotel close to the Mall. Reservations and payments must be received at least ten days prior to arrival.

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Foreign Study Tours

Aegean Sites of Civilization—October 7-29, 1978: A cruise on MTS *Argonaut* with Dr. Richard H. Howland, including Thrace, Istanbul, Troy, Ionia, Mt. Athos, Mistra, Thera, Crete and principal classical sanctuaries, leaving from and returning to Athens. *Optional prelude may be the following:*

Nostalgic Orient Express—October 2-8: Vintage cars restored to superb condition, over original Simplon routing from Zurich to Athens (waiting list).

Iranian Art and Archaeology—October 16-November 4: Led by Dr. Michael Roaf of Oxford, stay two nights in London, then Teheran, Shiraz, Persepolis, Pasargadae, Isfahan, Arak, Ecbatana, Kangavar, Bisitun, Kermanshah, Taq-i-Bustan, Qasvin, Varamin, Rey and Mashhad.

Red Sea Passage—February 1-11, 1979: Revised version of the very popular voyage of this past winter. Sail from Suez on the *Argonaut,* visit Karnak, Luxor, Valley of the Kings and Abu Simbel in Egypt, Petra in Jordan. Stay at the Mena House Hotel next to the Pyramids for Sakkara and Memphis, the mosques, bazaars and Archaeological Museum of Cairo. *Cruise subscribers may choose from the following two options:*

Jerusalem Prelude—January 25-February 2, 1979: Also visit Damascus, Baalbek, Bursa and Jerash before boarding in Suez.

Tanzania Game Preserves Postlude—February 11-18, 1979: Fly from Cairo to Kilimanjaro, visit Arusha, Ngorongoro Crater, Serengeti and Lake Manyara. Return to the United States via London.

Himalayan Cultures—March 21-April 5, 1979: Delhi, Agra, Calcutta, Darjeeling, Nepal (including tigers and Everest viewing), and Bhutan for a five-day exploration.

The Lands of the Hapsburgs—May 14-June 5, 1979: View palaces, country houses and related sites of the countries once dominated by the ruling family of the Austro-Hungarian Empire. Included are visits in and around Venice, Trieste, Salzburg, Linz, Budapest, Vienna, Bratislava and Prague.

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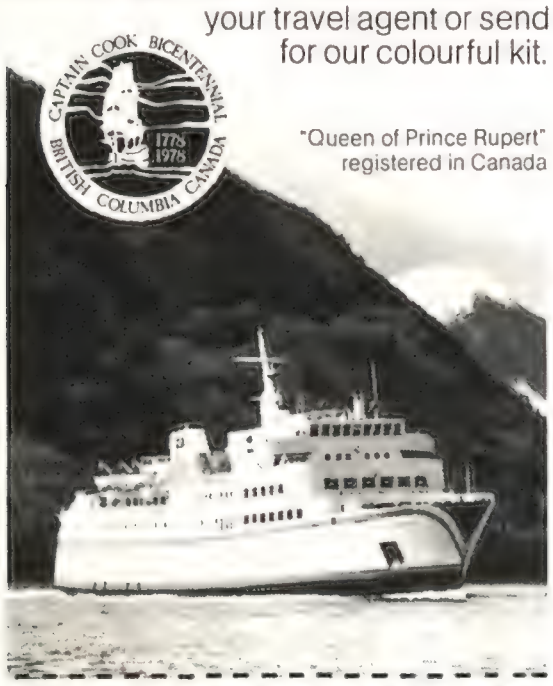

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Smithsonian highlights

September Events

Smithsonian Institution exhibition staffs traditionally grow very busy in the Fall, accounting for the size of the list of show openings. But as an end to outdoor summer functions the Smithsonian has one more weekend (Labor Day) celebration:

Smithsonian Frisbee Festival

The National Air and Space Museum presents the second annual Frisbee Festival on September 3 (rain date: September 4) with free instruction for everyone, fancy-maneuver workshops and an exhibition by champions, between noon and 5 P.M. near the Washington Monument.

Facing the Light

A loan exhibition of 110 historic American portrait daguerreotypes (see below)

Courtesy of the Boston Anthenaeum

Nathaniel Hawthorne's children pose for a daguerreotype, on view from September 22, National Portrait Gallery.

New Sounds
from The Smithsonian Collection of Recordings

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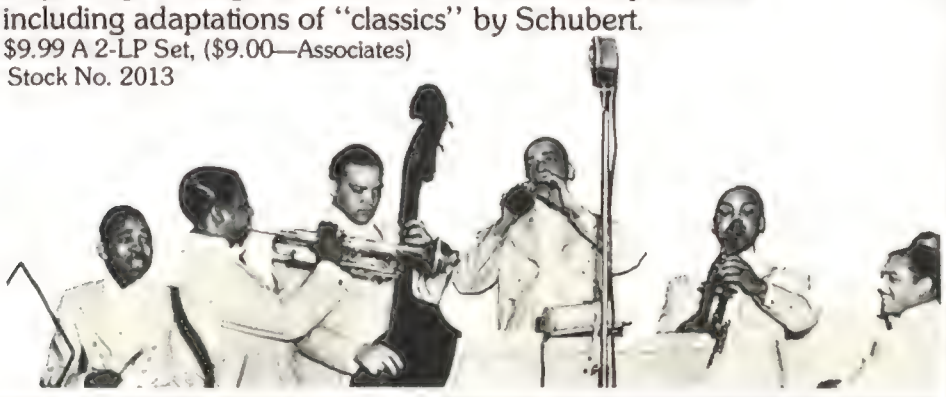

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To provide our members with improved subscription and related membership service, SMITHSONIAN magazine has changed to a more efficient computer fulfillment company in Boulder, Colorado. Our National Associate membership and subscription records have been transferred and are now at the new facility in Boulder undergoing conversion to the new system. For technical reasons, some transactions and adjustments will not take effect until mid-October. We apologize for the delay this may cause and thank you for your patience during the changeover to a new system which is expected to improve both the quality and speed of our service to you.

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opens September 22 at the National Portrait Gallery. The exhibit represents the Museum's first major research effort featuring the photographic process developed 140 years ago. Many rare portraits can be viewed here until February 4, 1979.

The Portrait Sculpture of Jo Davidson
A new room opens at the National Portrait Gallery on September 14 devoted to the work of this American sculptor.

World War II Aviation Film Series
The National Air and Space Museum begins its fall film series on September 7 at 7:30 P.M. with *I Wanted Wings* in the museum's theater. The series continues through November 16 with films each Thursday evening.

Botanical Paintings
by O. T. Ravindran
The Museum of Natural History opens a show of 40 watercolors of climbing vines by this Indian artist on September 16, continuing through November 12.

George Grosz: Selections from the Hirshhorn Museum and Sculpture Garden
The Hirshhorn show of 34 watercolors and four oil paintings comments on life in Germany between World War I and the rise of Nazism—September 13 through January 14, 1979.

An Eye and an Instinct for Tools
These selections from the collection of the John R. Gerwig jr. Collection opens in the Museum of History and Technology on September 1.

New Stained Glass
Thirty-eight examples of contemporary stained-glass objects, representing the work of 12 artists, are at the Renwick Gallery September 1 through February 10.

Washington Print Club
Sixth Members' Exhibition
A selection of about 50 prints includes work by Cézanne and Rembrandt, as well as contemporaries Jim Dine and Red Grooms, and opens on September 15 at the National Collection of Fine Arts.

Mexican Masks
An exhibition of 75 contemporary masks, part of the festive and religious tradition of Mexico, opens September 29 at the Renwick and runs through February 19.

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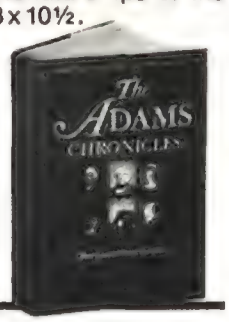

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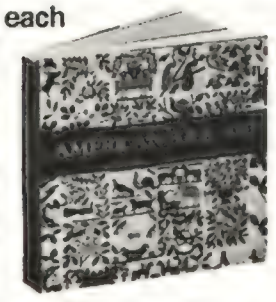

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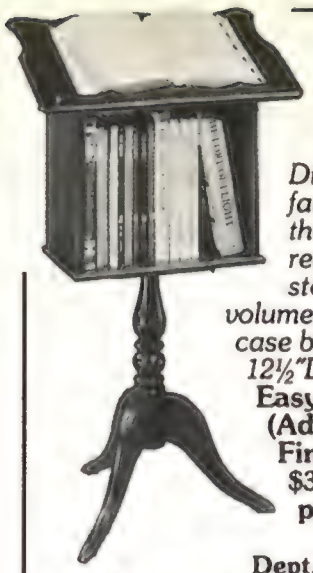

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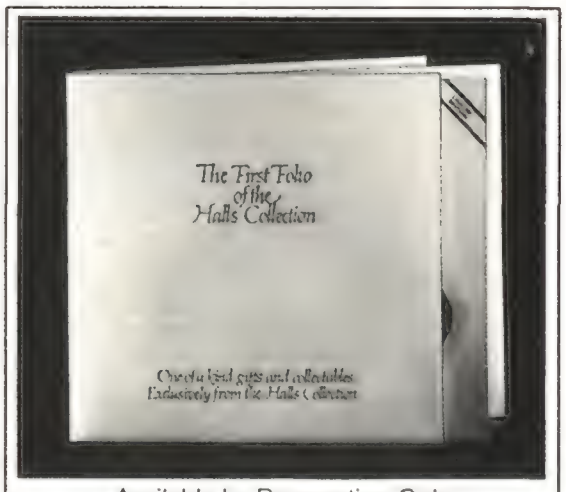

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Women in Science in 19th-century America
This show at the Museum of History and Technology features the scientific instruments women used in the last century and includes botanical and anthropological specimens collected by women. The exhibition runs from September 15 through March 1, 1979.

Division of Performing Arts and Musical Instruments
A new series of concerts begins on September 10 when the renowned jazz musician Dizzy Gillespie sits in with The Airmen of Note at Baird Auditorium, Museum of Natural History, at 3 P.M. Other September listings follow:

- Jimmy Witherspoon performs with The Airmen of Note, September 17, Baird Auditorium, 3 P.M.
- A Beethoven Competition is to be held on September 23 in Baird Auditiorium from 9 A.M. until 5 P.M.
- Joe Williams performs with The Airmen of Note on September 28 in Baird Auditorium at 3 P.M.
- The Bharata Natyam dancers, a troupe from India, perform on September 28 and 29 in Baird Auditorium at 8 P.M.

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SITES circulates exhibitions to hundreds of cities throughout the United States. To sponsor a show in your community write: Eileen Harakal, SITES, Smithsonian Institution, Washington D.C. 20560. A list of some September openings follows:

- Scottsdale, Arizona—"The Sculpture of Jacob Epstein" opens at the Scottsdale Center for the Arts on September 9 and continues through October 8.
- Los Angeles, California—"French Folk Art" opens at the Crafts and Folk Art Museum on September 2 and continues through October 15.
- Pocatello, Idaho—"Paper as Medium," the John B. Davis Art Gallery, opening

on September 23, through October 22. • San Antonio, Texas—"Folk Baroque in Mexico: Mestizo Architecture through the Centuries" opens at the Frost National Bank on September 9.

When Visiting the Smithsonian

Members are invited to begin their visit by registering with the Associate receptionist in the Smithsonian Institution Building—the castle on the Mall. Here, between 10 A.M. and 4 P.M. daily, Associates receive special orientation materials to ensure a more enjoyable visit. Membership cards are replaced upon presentation of a SMITHSONIAN magazine label. Information packets are available by postcard or telephone request: Associates Reception Center, Smithsonian Institution, Washington, D.C. 20560; (202) 381-6264.

The Court

Hours at the Court, the Associates restaurant located in the Museum of Natural History, change in September. Through September 4 (Labor Day) hours are 8:30 A.M. to 7 P.M. daily. Beginning September 5, hours for weekday luncheon are 11 A.M. to 3 P.M.; weekends, hours are 8:30 A.M. to 11 A.M. (breakfast) and 11 A.M. to 3 P.M. (brunch).

Winter Hours

On September 5 winter hours, 10 A.M. to 5:30 P.M., are reestablished at the Smithsonian Museums.

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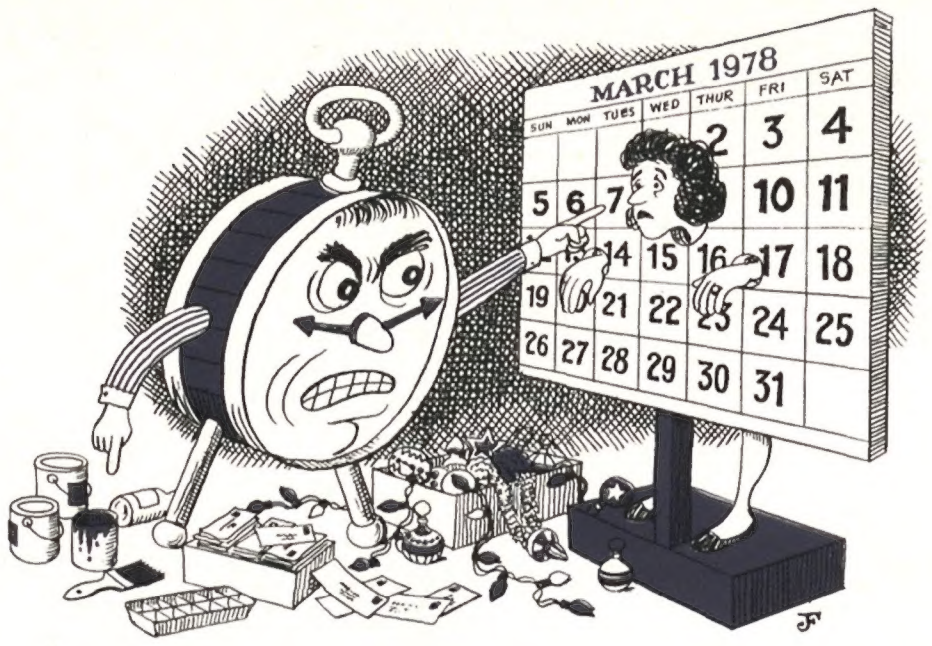
Wait—perhaps your cause is already lost



Somewhere in the pile of books, bills, papers and cats on my desk is an ad I clipped for a book about how to cure yourself of procrastination.

I desperately need this book, having long since modified the old adage "Never put off till tomorrow what you can do today" to "Never do anything you can avoid doing until your back is up against the wall." To make matters worse, I am married to a fellow procrastinator. This is like one heroin addict being married to another: we know we ought to kick the habit, but we have a sordid interdependence going and find it easier to believe that if we really wanted to, we could quit any time. Oh, sure.

Take the matter of the Christmas ornaments. Christmas is a nightmare for procrastinators because of the logistical problems it presents: buying and mailing cards and presents, lugging home and putting up a tree, planning the holiday party which, in our case, we are never sufficiently organized to give. (Any year now, we're actually going to follow through and give such a party. By that time, I figure, we'll be living in a nearby "mobile home ranch" unhappily named "Trail's End," and we can use the community center.)

But I procrastinate. About the Christmas decorations. . . .

As I write, it is midsummer and still on the counter top in the family room—the elephant's graveyard in our house for all the domestic clutter with which nobody wants to cope—are two large cartons of Christmas lights and wrapping paper. The latter is unusable the rest of the year because it's all relentlessly Christmas-oriented, and it seems a little tactless to wrap wedding presents in paper with a "HO-HO-HO" motif.

Obviously we ought to put this stuff up in the attic, although, as my husband reasonably points out, it's only another four months until next Christmas and then we'll need it again. And the attic is full of such a depressing collection of things we'll never use again that when I climbed the ladder and poked around for the ornaments *last* December, I told myself that before I stashed them away again, I'd clean it out.

I intend to do it, too, but there's no sense rushing into things and, anyway, God knows what's up there. I have to think about my physical safety. As for the Christmas cartons, we've arrived at an understanding. I don't bother them and they don't bother me.

Then there are the four pounds or so of unanswered correspondence waiting in a boot box in what is all too accurately called my den. I love receiving mail and am upset on days when I don't get any—doesn't anybody love me?—but I am temperamentally incapable of answering it unless I'm being threatened. ("Dear Madam: Remit at once, or. . . .")

So the mail piles up. For a while I kept it in a shoebox, and then, when the shoebox overflowed and it seemed I had no recourse but to sit down and take it from the top, I remembered the boot box and the crisis was averted.

Other problems don't lend themselves so easily to solution, especially when one stalls at length about addressing them at all and when one is aided and abetted by a fellow procrastinator. A sample conversation at our house:

"We've got to paint this place—it's getting shabbier and shabbier."

"I hate painting. You hate painting. Why don't we just have a gin and tonic?"

"We could, but I didn't get around to buying gin."

"Maybe we have vodka. We could have a vodka and tonic."

"We could if you'd got around to filling the ice trays."

"I hate filling the ice trays."

Meanwhile, having clipped that ad for the self-help book on how to stop procrastinating, I feel I've acted with nothing short of dispatch and thereby made a start at turning our lives around. Soon—perhaps in a week or ten days—I'm going to call the bookstore and order a copy, and fairly soon after that I'll make a point of reading it. It's on my list, right after working through the boot box full of mail, and the boot box comes right after buying gin.

Right now, unfortunately, I'm too busy even to make the phone call. We leave for a vacation in Spain in a couple of weeks, and I haven't yet signed up for the conversational Spanish course I intended to take. There's probably no hurry. I don't think my husband has got around to ordering the plane tickets yet.

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